

THE IRON AGE

A Review of the Hardware, Iron, Machinery, and Trades.

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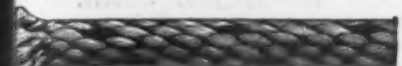
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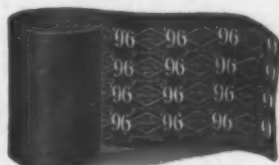
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THE IRON AGE

New York, Thursday, March 9, 1905.

A Large Sellers Planer with Pneumatic Reversing Mechanism.

An account of a special demonstration at the works of William Sellers & Co., Incorporated, in Philadelphia, Pa., of a large planer, weighing 60 tons, the table drive of which was controlled by friction clutches operated by air, was printed in *The Iron Age* of May 5, 1904. Details of the new features of the planer have now been made public, and a view of the complete planer is shown in the half-tone, Fig. 1, herewith. Fig. 2 is a section of the clutches, driving pulley and gearing, and Fig. 3 shows a piece of work which illustrates the positiveness with which the table may be reversed on successive strokes.

The planer is intended for work not exceeding 96

action. There are also two nearly vertical sides which do not bear under ordinary circumstances but are ready to resist side cuts which are sufficiently heavy to slide the table up on the wider V. This arrangement permits the table to run lightly under ordinary work but prevents it from lifting under any condition of heavy side cutting. The table rack has teeth of $2\frac{3}{4}$ -inch pitch and 10-inch face and is driven by a spiral pinion of five threads.

The driving and reversing mechanism is shown diagrammatically in Fig. 2. P is the shaft which carries the spiral pinion driving the table. On its outer end is mounted a spur wheel, O, which is driven by the spiral

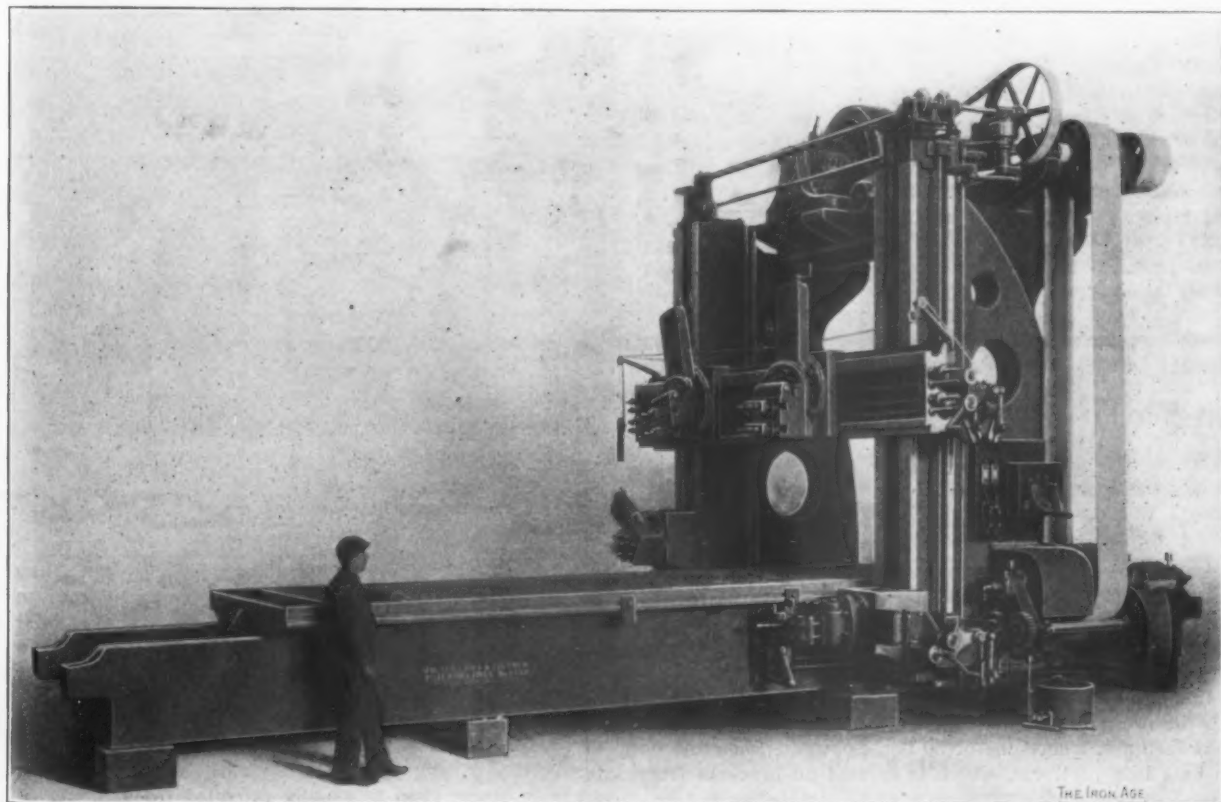


Fig. 1.—The Sellers Planer with Friction Clutches Operated by Air for the Table Drive.—Capacity, 96 x 96 Inches by 20 Feet. Weight, 60 Tons.

inches wide, 96 inches high and 20 feet long. It is provided with two cutting tools on the cross rail and one on each of the housings. Each of the two saddles has its own feed motion, independently adjustable in direction and amount. Each has also its own stopping and starting device, but the planer is so arranged that all of these can be thrown out of action or into action simultaneously by the motion of a hand lever, and this can be done from either side of the planer. The table has a constant return speed of 80 feet a minute and a variable cutting speed from 15 to 45 feet a minute. The table is supported in one flat and one V-bearing, which are lubricated by oil under pressure instead of through rollers or wipers. The oil is circulated through a piping system by a pump and returns to the oil tank through filters. The V-bearing has four surfaces, two forming a V of large angle sufficiently inclined to guide the table under ordinary circumstances but having the minimum wedging

pinion N on the pulley shaft. The driving pulley A runs loose on the pulley shaft K, being driven continuously and in the same direction while the planer is in operation. On the hub of the pulley A is a pinion, B, which drives through a reducing train of gears, C, D, E and F, a loose gear, G, also mounted on the pulley shaft. The gear G runs in the opposite direction to the pulley A, and at a reduced speed depending upon the ratio of the gears in the train. The pulley A is turned on one side to form the female half of a conical friction clutch. The gear G is turned on both sides in a similar manner. J and M are two conical male elements bolted together and forming an air tight cylinder free to move back and forth on the disk H, which is keyed and pinned to the shaft K and forms a piston in the cylinder. To compel the shaft to rotate with the friction clutch the head of the cylinder J is provided with notches into which project teeth on the surface of the piston H. These form a jaw clutch, and

permit end movement, while they compel the parts to rotate together.

Air admitted to one end of the cylinder through the center of the shaft K between the parts H and M causes the cylinder to move in the direction of the pulley A, pressing the friction cone against the pulley so that the clutch rotates with the pulley. This movement is transmitted through the piston H by the clutch teeth and causes the shaft to rotate in the same direction, which gives the return movement of the table. Admitting air to the opposite end of the shaft causes the clutch J to engage with the wheel G, forcing the latter against the stationary clutch L, which is keyed to the shaft so that the wheel G drives the shaft through both of the clutches, one on either side, in the proper direction for cutting at a speed which may be varied by changing the gears E and D. These are mounted on split bushings with conical holes, which permit the gears to be shifted with little trouble.

In the operation of the planer the table stops move an air valve which admits compressed air alternately to the opposite ends of the cylinder, and by regulating the velocity of the admission the speed of reverse can be

It has been demonstrated that the pneumatic clutch releases and engages with great regularity and very promptly, so that the stroke of the planer is remarkably uniform, the reverse taking place at the same point, and the overrun at the beginning of the stroke is only sufficient to allow the feed to act. Fig. 3 shows a casting which was first planed on one edge with a heavy roughing cut, the tool being held in one of the side heads. A square nose finishing tool was then substituted and the stroke shortened so that the cut terminated within the surface of the casting. The stopping point of the successive finishing cuts occurred in a practically true vertical line, as can be readily seen in the illustration.

Another novel feature of this planer is the manner in which the cross rail is secured to the uprights. The back between the uprights is extended in a rectangular form, with two vertical surfaces fitted with gibs to the inside surfaces of the uprights or housings. A flange on the back of the cross rail extension is provided with bolts working in T-slots in the inner faces of the uprights. Tightening these bolts draws the uprights against the cross rail, which is also secured to the face of the uprights in the or-

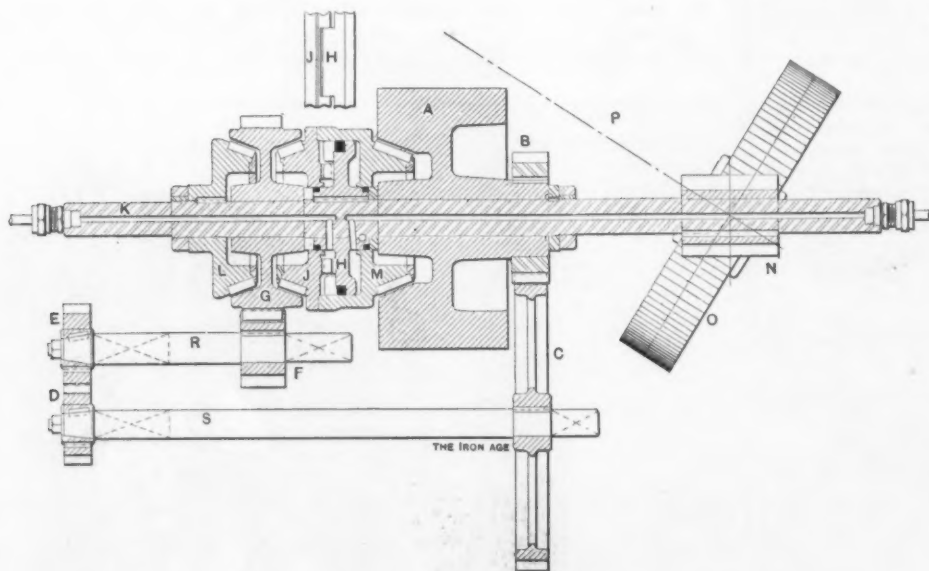


Fig. 2.—Sectional View of the Driving and Reversing Mechanism of the Sellers Planer.

nicely gauged. It is arranged so that the table is brought to rest promptly and started up in the opposite direction without shock. There is no reversal of high speed pulleys and the fly wheel action of the parts whose motion is reversed, owing to their relatively small size, is unimportant. The pulley A may be driven through countershaft in the ordinary manner or from a motor, as in the present instance, where one of 50 horse-power is mounted on a cast iron platform, which is carried on brackets from the housings and serves as a cross girt between them. The motor drives by a horizontal belt to a countershaft, which, in turn, drives the pulley shaft at the base of the housing.

A separate belt is used to actuate the lifting gear and drive the feed motion. The latter is accomplished through a positive motion clutch which is stopped and started at each reverse of the table. The movement of the table dogs not only actuates the air valve, but it trips the escapement train in the feed motion and allows it to make half a revolution. This gives a half turn to each of the crank disks, transmitted from the clutch through a square shaft on the side of the housing by bevels to a horizontal shaft driving a similar square shaft on the left hand housing. As each of these disks makes a half turn at each reverse the amount of feed is determined by the position of the crank. The work done by the dogs, it will be seen, is of the lightest character, and the shifting by hand is also easily accomplished. A novel feature of the side heads is that they are lifted by the same screws which carry the cross rail. These screws are stationary under ordinary circumstances, and the heads are raised and lowered by rotating the nuts.

inary manner. This method of bolting brings into play the strength of the housing to resist the torsion of the cross rail, and the cross rail stiffens the housing against the twisting action of the side heads. The effect is an enormous increase in the strength of the combined parts and unusually heavy cuts can be carried.

In some 54-inch planers of this construction two cuts of 60,000 pounds each were taken in steel without any perceptible spring of the cross rail, although it was scarcely larger than is usually provided for a planer of that width.

The Hydrex Felt & Engineering Company, which has just commenced business at 120 Liberty street, New York City, devotes its energies exclusively to the subject of water proofing. This is a branch of engineering which has hitherto been comparatively neglected, but with the great activity in tunnel building and in structural work requiring deep foundations the importance of the subject now warrants the attention of specialists. This is the first company which besides offering water proofing material also draws up plans and specifications and attends to the engineering details of this class of work. The manager of the new company is Edward W. De Knight, who has taken a prominent part in preparing the plans for water proofing a number of great engineering enterprises. The new company is an offshoot of the old established concern of F. W. Bird & Son, East Walpole, Mass. It starts business under favorable auspices, as "Hydrex" felt has been specified for the Pennsylvania tunnel under New York City, the Baltimore & Ohio-Pennsylvania improvements at Washington, and other important projects.

The Philadelphia Foundrymen's Association.

The regular one hundred and forty-fifth meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club March 1. Alexander E. Outerbridge, Jr., vice-president, called the meeting to order at the usual hour. The treasurer, Josiah Thompson, reported a balance of \$2197.74 on hand, with all indebtedness paid. A communication was read from the Associated Foundry Foremen of Philadelphia and Vicinity, with headquarters at 1425 Filbert street, inviting associate membership to their organization by members of the Foundrymen's Association. This membership includes those interested in the trade who are either superintendents, foundry foremen or foremen core makers, the dues being \$1 per year.

The paper before the association for the evening was



Fig. 3.—A Piece of Work Showing the Planer's Ability to Reverse at the Same Point on Successive Strokes.

on "The Fremont Testing Machine for Determining the Fragility of Iron and Steel," by Thorsten Y. Olsen, Philadelphia, prepared from Mr. Olsen's translations from the French of Mr. Fremont, and from the personal experience of the author. In this method of testing the principle is that of breaking a small test specimen by impact, and measuring the residual force of the hammer blow, the hammer being of standard weight and falling from a predetermined standard height. While most of the tests, Mr. Olsen said, had been conducted on steel, he had no doubt that for testing cast iron fragility a machine similar to the one used by Mr. Fremont could be utilized, where neither the drop nor the weight of the hammer need be as great, and thus lighter springs could be used which would equally well show the different qualities of the material. As cast iron is extremely fragile, the speed necessary for rupture need not be much greater than that necessary to produce it for steel, or, in other words, the amount of work required to produce rupture would not vary to such an extent with the speed of impact as in the case of steel. Lately a great variety of new methods for testing have been devised, such as tests by repetition of

blows, which, according to Fremont, is but a mild form of test when compared to that of fracture by single impact, as is done on the Fremont machine.

In discussion it was brought out that impact tests on cast iron were of great value, results of tensile strength and impact tests on duplicate specimens of cast iron showing a wide variation. Mr. Outerbridge explained some early experiments along this line. Originally, he said, experiments were made with a direct drop or "gallows" type of machine with indifferent results. Since then further experiments had been conducted with a swinging hammer of 20 pounds weight, suitably mounted to reduce friction to a minimum. Bars to be tested by transverse test were broken by one blow and the force of this blow measured by a suitable device. This method had its limitations, however, in the size and length of swing of the hammer. Repeated blows of a hammer from gradually increasing height gave unsatisfactory results, owing to the increased strength imparted to the cast iron bar, due to the release of internal strains resulting from the rearrangement of the molecules of iron under such treatment.

After a vote of thanks to Mr. Olsen for his interesting paper the meeting adjourned.

New Equipment for the Los Angeles-Pacific Railroad.

Owing to the greatly increased traffic on the interurban railway system of the Los Angeles-Pacific Railroad Company, it has been decided to increase the capacity of the central power house at Vineyard, Cal., and to install an additional substation in Los Angeles. The new electrical equipment has recently been contracted for with the Crocker-Wheeler Company through its Pacific Coast manager, the Abner Doble Company, San Francisco. The machinery comprises one 1200-kw. three-phase, 50-cycle, 2300-volt, engine type generator; one 300-kw. and one 400-kw. motor generator set; three 400-kw., three 160-kw. and three 120-kw. transformers, and a 60-kw. engine type exciter. The 1200-kw. alternator will be of the new C-W revolving field type, and will be driven by a 2000 horse-power compound condensing McIntosh & Seymour engine. The motor generator sets will consist of 2300-volt synchronous motors driving 600-volt direct current railroad generators. The transformers will be built for 15,000 volts on the primary and 2000 volts on the secondary, and will be of the new water cooled and oil insulated type recently brought out.

The interurban railway system of the Los Angeles-Pacific Railroad Company embraces nearly 200 miles of lines. The company owes its growth largely to the energetic and untiring work of the president and manager, E. P. Clark, who was one of the pioneer railroad men of Southern California. The system extends from Los Angeles in a fan shape to Santa Monica, Ocean Park, Playa del Ray, Hermosa, Manhattan Beach and Redondo on the ocean, and passes through the intermediate towns of Hollywood, Colegrove, Sawtelle, Sherman and Palms. Most of the lines have been double tracked, and are constructed in conformity with the best steam railroad practice. About a year ago a new central steam plant was installed at Vineyard, about five miles west of Los Angeles, and from this station transmission lines at 15,000 volts carry the power to several substations located at intervals over the system. The new equipment is to increase the capacity of this central station and to supply additional power for the operation of the lines in Los Angeles.

The electric fountain which for many years was one of the attractions at Schenley Park, Pittsburgh, has been sold to Homer Bowes, a dealer in rails and machinery in that city. The fountain originally cost \$30,000 and was a lucrative investment for the Pittsburgh Railways Company, whose stockholders conceived the idea and paid the cost of erection, after which the city of Pittsburgh took charge and sustained the subsequent expense of operating. Mr. Bowes expects to dispose of the electric fountain for re-use as an amusement attraction, but may dismantle it and dispose of the material on a scrap basis.

A Large Electric Motor.

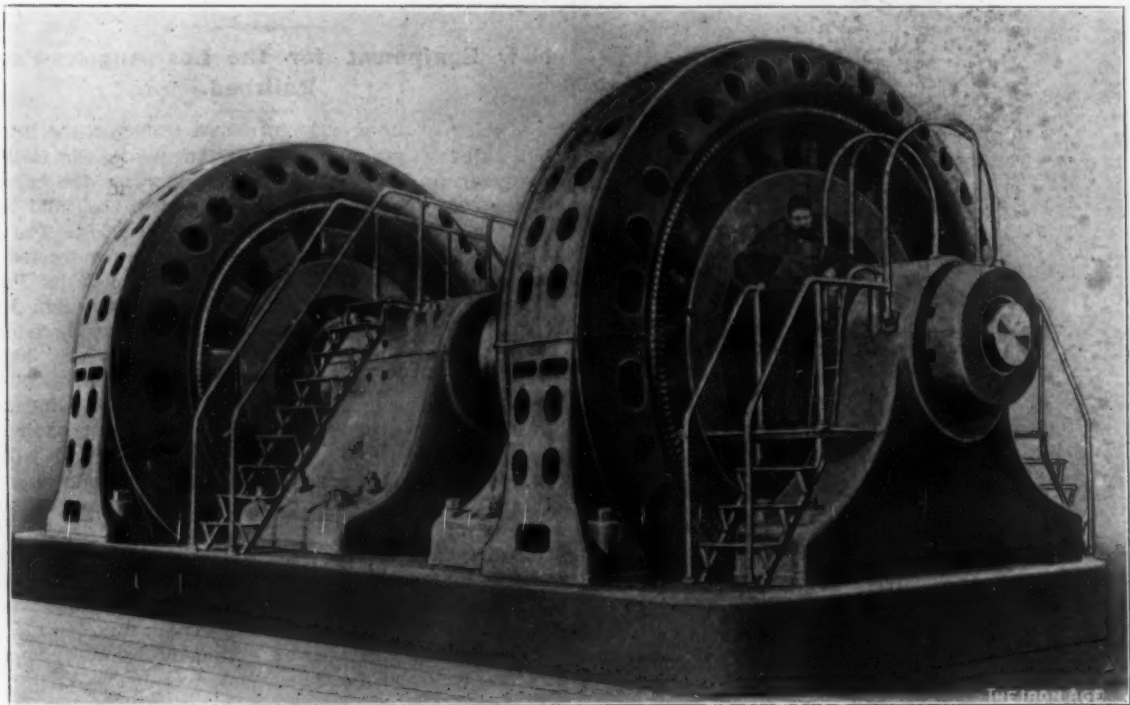
As the driving end of a motor generator now being installed at the plant of the Shawinigan Water & Power Company, Shawinigan Falls, Quebec, Canada, there is used the largest electric motor ever built. It is a synchronous motor of 8000 horse-power recently constructed by the Allis-Chalmers Company at its Bullock electrical works in Cincinnati, Ohio, and embodies in its design the characteristics of the Bullock alternators. The generator driven by this motor is rated at 5750 kw. at 300 revolutions per minute. The machines together are remarkable for concentrating in an exceedingly small floor space a combined capacity of 12,000 kw.

The half-tone of the machines shown herewith is a reproduction of a photograph taken while they were being tested at the shops by the Behrend system under full load conditions, corresponding to 7200 kw. on the generator. With the Behrend system an expenditure of not more than 300 kw. produces the same losses as would exist in the machine under full load conditions. The generator and motor together form a frequency changer,

way, nor do the Morse signals interfere with the telephone.

At the receiving end the current is received through a polarized relay, which is held open by the alternating current, and allows a secondary slow acting relay to throw the current on the ringing mechanism. Telephone relay stations intermediate between sending and receiving points are bridged around the Morse relay by condensers, both for the ringing and talking current, which prevents the direct current used for telegraphing from passing through the telephone instruments. Each instrument on the telephoning service is afforded a ground connection with each other instrument by means of ground wires attached to the rails of the railroad.

Another feature of the telephoning system is a portable apparatus, which may be carried in engines or cabooses, and which has already been adopted for wrecking trains. The outfit consists of a jointed bamboo pole and a coil of insulated wire with a galvanized hook at the end of the pole, arranged with a spring by which contact is made with the line wire without injuring it. The earth connection of the portable system is



An 8000 Horse-Power, 5750-kw., Bullock Motor Generator for the Shawinigan Water Power Company, Shawinigan Falls, Quebec.

the working of which at Shawinigan Falls will be watched with interest, and if it is as successful as the builder anticipates there will be forthcoming valuable additions to existing data concerning alternating current machinery.

Telephones for Railroad Service

The American Telephone & Telegraph Company, Chicago, has perfected a system by which it is feasible to send telephone messages over regular grounded telegraph lines without requiring an additional line wire and without interfering with the telegraphing. The need of such a system has been pronounced, as the usefulness of the telephone to railroads has been such that many miles of separate telephone wires for railroad service only have already been constructed paralleling telegraph wires. The invention of the new system will make such supplementary service unnecessary. In this system a primary battery is used, the direct current being passed through an interrupter and induction coil to transform it to alternating current of a very high frequency. This results in the transmission over the wire of telephonic impulses at so high a frequency that they do not interfere with the Morse instruments in any

made through a rail clamp of galvanized steel. Accompanying the system is a low frequency ringing generator.

This new system is being installed by nearly all the Western roads, the roads signing a contract specifying that the system shall be used exclusively for their own service and will not be permitted to compete in any way with the Bell telephone service. In installments already perfected it has been found that it is entirely practical to telephone 200 or 300 miles over operating telegraph wires.

The device was invented by A. J. Ferguson, assisted by E. L. Andrews. Harry L. Burdick has charge of the contract work of the railway department of the American Telephone & Telegraph Company.

The Duluth & Iron Range and the Duluth, Missabe & Northern roads have doubled their orders for steel cars and locomotives to increase their ore handling facilities this year. The original order of the first named road was for 4 locomotives and 300 cars, but this has been increased to 9 locomotives and 500 cars. The Duluth, Missabe & Northern's original order has been increased by 6 locomotives and 500 cars, making its total order now 1300 ore cars and 12 locomotives.

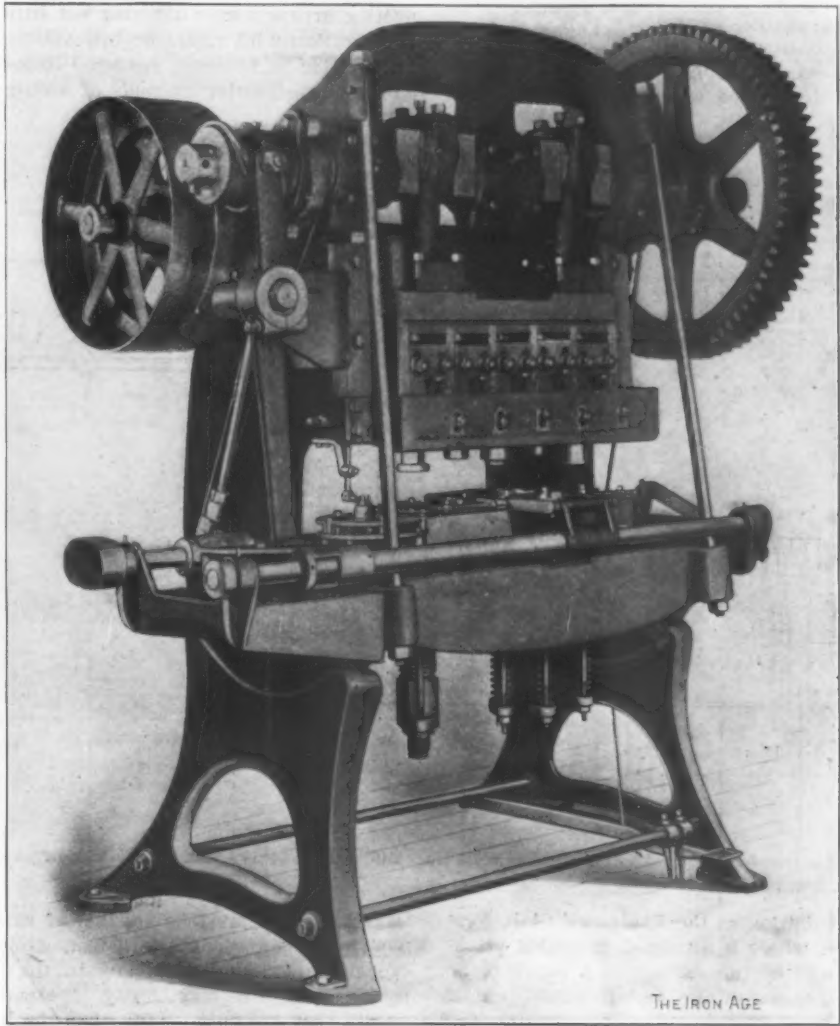
The Consolidated Automatic Five-Slide Press.

The machine illustrated herewith was designed by the Consolidated Press & Tool Company, 100 North Clinton street, Chicago, especially for drawing and finishing sheet metal shells where a number of operations are required for finishing, such as harness oil can tops, varnish can nozzles, burner shells, lantern parts, stove trimmings, &c. The first operation is usually made in a combination die and the shells thus produced are placed on the friction dial, shown at the left of the press, the reciprocating feed carrying them from one die to the other, the discharge being automatic. The press runs at a speed of 60 revolutions per minute, a finished shell being produced at each stroke. When the stock used may be obtained in strips of the proper width a roll feed takes the place

The Advance in Coke Workers' Wages.

The graduated advance in wages of coke workers made March 1 by the H. C. Frick Coke Company, Pittsburgh, was briefly referred to in these columns last week. The new scale of wages, together with the old rates, is as follows:

	New rates.	Old rates.
Mining and loading room and rib coal, per 100 bushels	\$1.20	\$1.10
Mining and loading heading coal, per 100 bushels ..	1.37	1.25
Mining and loading wet heading coal, per 100 bushels	1.45	1.30
Drawing coke, per 100 bushels charged.....	.70	.63
(All the above by same measurement as at present.)		
Drivers and rope riders (shafts and slopes), per full run.....	2.40	2.20
Drivers and rope riders (drifts), per full run....	2.30	2.10
Cagers, per full run.....	2.40	2.20



An Automatic Five-Slide Shell Drawing Press, Built by the Consolidated Press & Tool Company, Chicago.

of the dial feed, and the article is finished complete from the strip.

While the illustration shows the machine fitted with five sets of dies, a greater or less number may be used, depending on the number of operations required for finishing the article to be made. The number of dies that can be used in the press is limited only by the number of times the stock will stand handling without annealing. The machine is built in several different sizes, the large sizes being used for making articles from the heavier gauges of brass and sheet steel.

With five sets of dies 160,000 to 180,000 operations may be performed in 10 hours, which is equal to the work of 12 to 15 operators with single presses. As an indication of the economy resulting from the use of this machine one user claims in six months to have saved enough over the way he was doing his work previously to pay for the machine.

Track layers, blasters and timbermen (shafts and slopes), per day.....	2.40	2.26
Track layers, blasters and timbermen (drifts), per day	2.30	2.10
Assistant track layers and inside laborers, per day	1.75	1.60
Dumpers and tipplemen, per full run.....	1.80	1.65
Teamsters, per day.....	1.70	1.60
Carters, per day.....	1.60	1.50
Leveling, per oven.....	.11½	.10½
Chargers, per oven.....	.04½	.04
Chargers, per day.....	1.85	1.70
Forking cars, 40,000 pounds capacity and less...	1.50	1.40
Forking cars, 50,000 and 60,000 pounds capacity ..	1.60	1.50
Forking cars, over 60,000 pounds capacity.....	1.75	1.60

The prices for all other labor regularly employed in the operation of the plants will be proportionate with the above. Payments are semi-monthly, same dates as heretofore.

As soon as the announcement of this advance came out all the other coke producers made a similar change. It may be stated that coke labor is now being better paid than for some years.

In Commemoration of Henry Cort.

Charles H. Morgan, president of the Morgan Construction Company, Worcester, Mass., has caused to be made two fine bronze tablets in memory of Henry Cort, inventor of the art of puddling iron with coal and of rolling metals in grooved rolls. Mr. Morgan has presented one of these tablets to the church at Lancaster, England, the birthplace of the famous Englishman, and the other to the church at Hampstead where he was buried. The tablets have been accepted, and will occupy conspicuous positions in the church interior. They contain a bust of Cort, in *alto relievo*, with this inscription beneath it:

IN MEMORY OF
HENRY CORT.
Born at Lancaster, 1740.
Interred at Hampstead, 1800.
To Whom the World is Indebted
For the Arts of Refining Iron
By Puddling with Mineral
Coal and Rolling Metals
In Grooved Rolls.

Critics who have seen the tablet have been impressed by the excellence of design and workmanship. The orig-

An Electrical Mill Lever.*

BY F. JANNSEN.

Some auxiliary mechanisms in rolling mills, lifting tables, levers, manipulators, &c., perform functions which involve a reciprocating motion carried out in a fraction of a second. The movement is followed by a period of rest, and it is essential that all parts shall come to a dead stop upon completion of the stroke. To obtain this result with electric power, use is often made of clutch couplings, reversing gear, &c., between the motor and the parts to be operated, but the results have usually been clumsy and often complete failures. This is particularly true in the case of rolling mill levers and lifting tables requiring an especially rapid movement.

The thought naturally arises whether in such cases use could not be made of electro-magnets, thereby permitting arrangements differing but little from those now in operation with steam or hydraulic power. This simple solution is, however, rendered impossible by the difficulty of constructing magnets of such great power. The

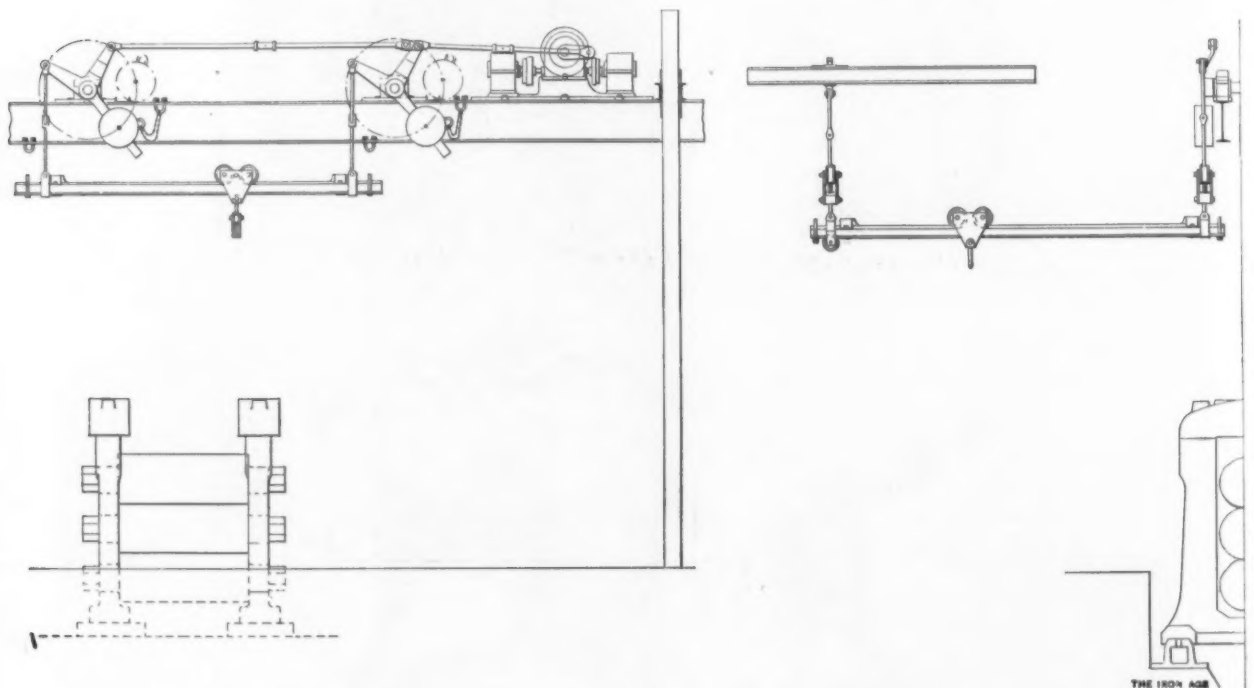


Fig. 1.—An Electrically Operated Lever Serving a Rolling Mill.—Built by the Benrath Machine Works, Germany.

inal mold was on exhibition at the Engineers' Club, New York, for some days, where it attracted favorable attention. Henry Cort will be the subject of a paper to be printed soon in the *Journal* of the American Institute of Mechanical Engineers.

Mr. Morgan presented a large crayon portrait of Henry Cort to the Worcester Polytechnic Institute, at the meeting of the Mechanical Engineering Society, March 3, through Victor E. Edwards, Tech., 1883, of the Morgan Construction Company, who was the lecturer of the evening, speaking on "Rolling Mill Machinery." Mr. Edwards in his remarks spoke of Mr. Morgan's long time admiration of Cort and of the fact that his address as the retiring president of the American Society of Mechanical Engineers was devoted to an account of the life of the great inventor.

A great deal of interest is taken in New England over the surveys which the New York Central Railroad is making between Springfield, Mass., and Golden's Bridge on the Harlem Railroad, with a view to complete a line of its own between Boston and New York. At the present time the New York trains of the Boston & Albany division have to make 135 miles of the journey over the tracks of the New York, New Haven & Hartford. The chief interest lies in the increased and possibly cheaper freight facilities which would thus be provided.

smallest levers must be capable of raising 1000 to 1500 pounds a distance of 2 to 3 feet, while magnets with a capacity of 40 to 50 foot-pounds, the largest heretofore constructed, are very bulky. For any considerable weight they are only useful when the lift is very small.

Electric motors, suitably wound, however, combine with high efficiency a lifting moment, which especially on starting, is capable of being increased enormously. They are therefore eminently suited for rapid movement, while the stroke may be lengthened indefinitely without influencing the lifting moment. It is of course necessary to transform the rotary into a reciprocating motion, and it is chiefly on this mechanism and on that of the controller that the success or failure of the system depends. The essential simplicity can only be obtained by reversible individual motors together with the avoidance of great differences in speed between the various parts and of all reversing gearing.

Fig. 1 shows an electric lever built by the Benrath Machine Works, Germany, which has been in successful operation for months. The two rails on which the hook trolleys run are suspended from bent levers, the fulcrums of which rest on a beam running across the building directly over the housings. This beam also carries the motor, intermediate gearing and brake, so that the connecting rods are as short as possible. This location of

* Translated from *Stahl und Eisen*.

the motor gives no trouble, as it is of an inclosed type and needs but little attention, while it makes possible the fewest moving parts and allows the turning moment to be directly transmitted. Counterweights are essential, as they reduce the work of the motor to that needed for acceleration and overcoming friction.

Power is supplied by two direct-current, series-wound motors, and is transmitted through a worm gear to a crank motion, giving a powerful starting moment and an economy in power. In the present case an ample reserve was specified, so that the use of two motors was essential. The controlling apparatus is so arranged that each motor by a simple switch can be cut off from the feeders without making any change in the circuit. Extensive trials have shown that one motor is sufficient to operate the lever, so that in case the other breaks down the coupling can be removed and the armature changed at leisure. Should a defect develop in the field

ly electric. Power is supplied through a slow speed alternating current motor, and an electrically operated brake is used in this case also.

A short circuit of terrific force and volume occurred February 23 under switchboard No. 1 in power house No. 1 of the Niagara Falls Power Company, causing the death of at least one man and burning two others very seriously, while it also entailed costly damage to the installation. The men were in the switch chamber and cable subway changing the connections between a 2300-volt transformer and a small transformer used for lighting purposes when the short circuit occurred. There was a tremendous explosion, the greatest yet experienced in the Niagara power development. The insulation of the adjacent conductors took fire and the flames spread to the cables beneath the switchboard. The fire was con-

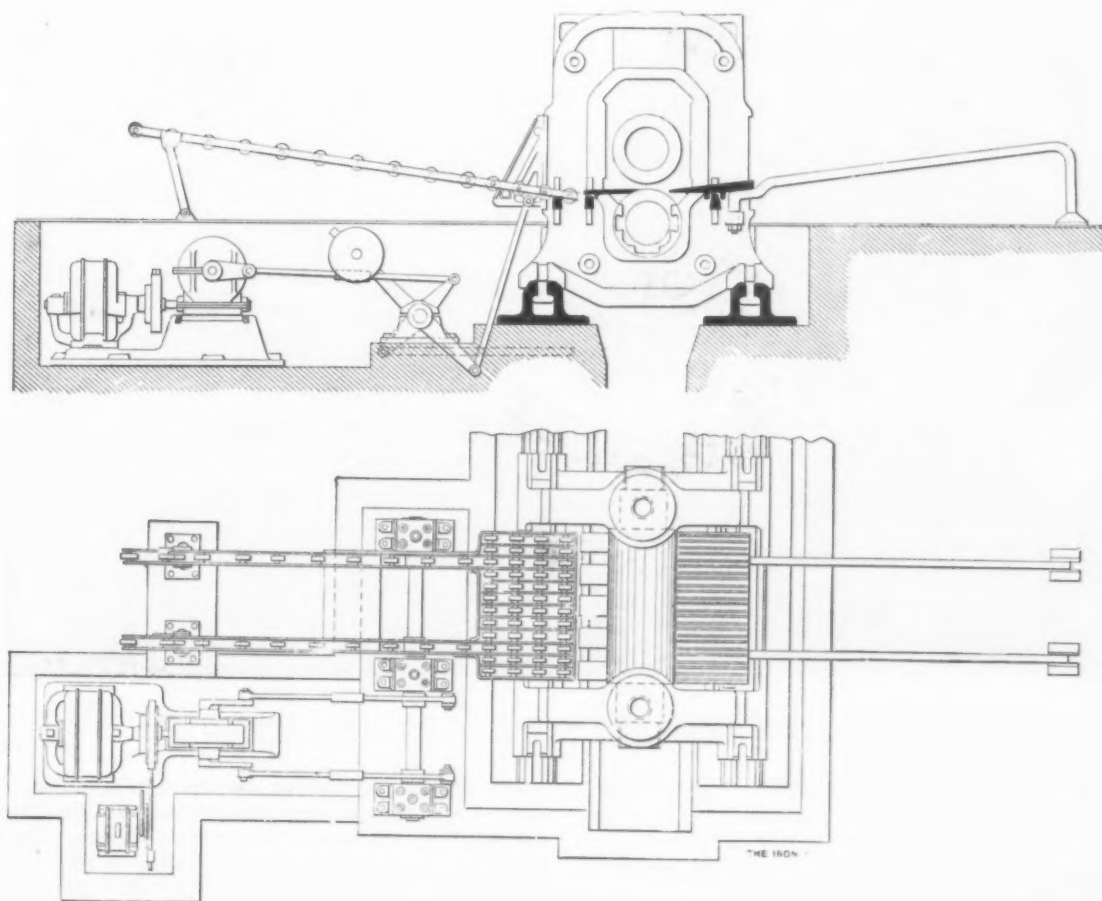


Fig. 2.—An Electrically Driven Lifting Table with a Lever Arrangement Similar to the One in Fig. 1.

coils the armature can, if necessary, remain in place till repairs can be effected. The connection between the crank motion and the bent levers is made by adjustable connecting rods, symmetrical on both sides of the supporting beam. Bent levers, bearings, trolleys and the rails on which the latter run are all of the usual construction.

The arrangement of the brake is interesting. It consists of a weight operated by a magnet acting on the brake band, the drum serving also as a coupling. Together with the two motors, it is mounted on a cast iron frame, which also serves as a base for the worm gear and crank motion. The worm gear was made with special care, the screw being steel and the worm wheel phosphor bronze, with a cast steel hub. The screw shaft has a ring oiling arrangement and ball bearings. The whole runs in oil in inclosed cast iron case.

The controllers are placed on the roller platform situated directly in line with the housings, thus enabling the operator to see both sides of the mill equally well.

Fig. 2 shows an electrically driven lifting table of similar arrangement, the controlling mechanism being pure-

quered, but not until the auxiliary wiring leading to the instruments and field rheostats was practically destroyed, temporarily rendering inoperative the five 5000 horse-power generators controlled from this switchboard. As soon as possible the load normally carried by these five machines was transferred to other machines, a performance made possible by the fact that at present the total load carried by the company is about 80,000 horse-power, whereas its machines generate 105,000 horse-power. The long distance load was off for about 20 minutes. In fact, this service was resumed before the fire was out.

French experiments on the efficiencies of gears fitted for motor car service give the following results in percentages for new and worn gears, respectively: Spur gearing, steel on steel, greased, exposed to street dust, 90 and 80; spur gearing, steel pinion and fiber gear wheel, 88 and 80; spur gearing, leather pinion and cast iron gear wheel, 88 and 80; spur gearing, steel on steel, running in an oil bath, 92 and 90; bevel gearing, steel and steel, in an oil bath, 88 and 82; universal joint, 95; roller chain, lubricated and exposed to the air, 94 and 92.

The Railway Steel Spring Company.

At the annual meeting of the Railway Steel Spring Company, held at Jersey City, March 2, a resolution was adopted reducing the number of directors from 15 to 11, and the following were elected: Julius E. French, W. H. Silverthorn, Charles Scott, Jr., Frank S. Layng, S. L. Schoonmaker, Frank Q. Barstow, Philo N. French, Charles Miller, James W. Fuller, Charles W. Barnum and William M. Barnum. The directors who retired as a result of the reduction in the board are: James C. Beach, T. H. Newberry, M. B. Parker and Charles Scott. The vacancy caused by the death of Samuel R. Callaway was filled by the election of Wm. M. Barnum.

The company in common with other industrial corporations suffered from the reaction in business during the first half of last year, a fact that was brought out in the statement for the year ended December 31, 1904,

Automatic Starter for Motor Driven Pump.

In a large business building in Holyoke, Mass., the Deane Steam Pump Company of the same city recently installed an electrically driven triplex pump in connection with a hydraulic plunger elevator, the automatic operation of which is of an unusual character. The hydraulic elevator is of the type in which the car is directly supported from beneath by a long plunger working in a cylinder, into which water is admitted as desired from a closed tank. This tank is supplied with water by a 5 x 8 inch Deane vertical triplex single acting power pump designed for a maximum water pressure of 150 pounds. Means are provided for automatically stopping and starting to maintain a pressure in the tank between certain fixed limits.

The pump is belt driven by a 15 horse-power General Electric type L induction motor supplied with a three-

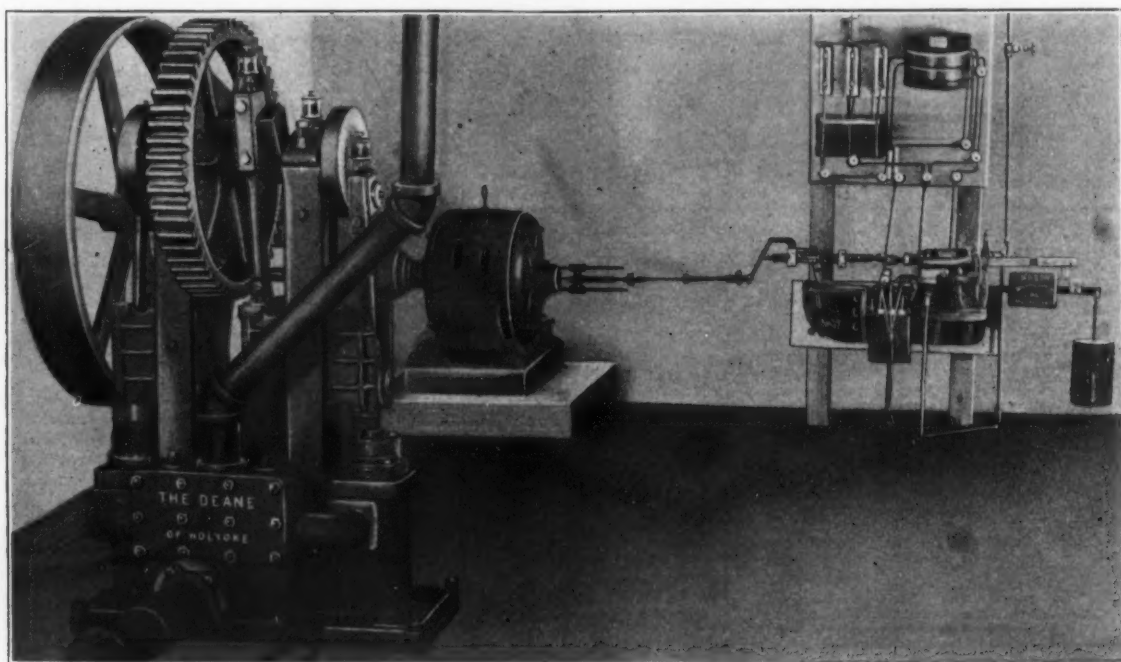


Fig. 1.—View of the Pump, the Motor Driving It and the Automatic Controller.

presented at the annual meeting, and which is as follows:

<i>Assets.</i>	
Plants	\$24,534,214.56
Merchandise on hand.....	826,520.27
Stocks and bonds.....	259,101.85
Accounts receivable.....	1,056,568.49
Other items.....	32,670.69
Cash	2,180,808.43
Total.....	\$28,889,884.29
<i>Liabilities.</i>	
Capital stock, preferred.....	\$13,500,000.00
Capital stock, common.....	13,500,000.00
Accounts payable.....	194,164.26
Reserved for preferred stock dividend, taxes, &c..	114,849.19
Surplus	1,580,870.84
Total.....	\$28,889,884.29
Surplus, December 31, 1903.....	\$1,705,885.74
Less dividend on common stock.....	269,988.00
	\$1,435,897.74
Net earnings for 1904.....	\$1,089,943.35
Less dividends on preferred stock.....	944,970.25
	\$144,973.10
Carried to surplus.....	\$144,973.10
Surplus December 31, 1904.....	\$1,580,870.84

Notwithstanding the poor results of 1904 officials of the company are cheerful as to the future, basing their views upon the current revival of activity in the iron and steel trade, which is gradually spreading to all branches.

phase 60-cycle alternating current at 550 volts. The motor has a variable starting resistance inside, which is thrown in or out by a sliding rod or shifter. The generator supplying current to the motor is of such a small size that it was feared the fluctuations from frequent stopping and starting of the motor would seriously affect the regulation of the potential of the distributing system, and the type of motor selected was deemed best adapted for these conditions. Before starting the motor the resistance, which is included in the armature circuit, is thrown in. As the motor increases its speed the resistance is gradually cut out by moving the sliding rod or shifter. To stop the motor current is first cut off by an oil break switch, after which the resistance is thrown in ready for the next start.

Although numerous devices are in use for controlling ordinary types of motors having starting boxes of the usual construction, there are no devices on the market for operating this type of motor automatically. The controlling device was therefore designed especially for this work by the Deane Steam Pump Company, and the accompanying illustrations show this automatic controller and its arrangement in combination with the motor and pump.

A water pipe connects the elevator pressure tank with a Mason automatic belt shifter, consisting of a diaphragm chamber and a cylinder in which a piston moves. The pressure of the water beneath is balanced by a heavy weight, and any variation of this pressure causes the diaphragm to move the pilot valve, admitting water to the cylinder for moving the piston. The belt

shifter is connected with a special device, so that when the pressure in the elevator tank falls below a certain point the upward movement of the piston in the cylinder first closes the switch, admitting current to the motor, and then throws the resistance rod to cut out the resistance. As soon as the pressure in the tank has been raised to the desired point the controlling device first opens the switch to stop the motor and then throws in the resistance by pulling out the rod or shifter. This is accomplished by a set of cam pawls mounted upon the slide connected with the piston of the shifter cylinder, which engage a lever connected with the break switch. These cams always throw the switch lever before the resistance is shifted, no matter in which direction the piston moves.

This device in connection with this type of motor has successfully solved the problem in elevator work where the current is used for both lighting and power service and the generator is of small size. The Deane Steam Pump Company is prepared to supply this appa-

are the largest of the kind ever constructed at the Riter-Conley shops.

Westinghouse Specifications for Pig Iron.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has recently adopted new specifications governing its purchases of pig iron, which are as follows:

All grades of pig iron will be bought strictly by analysis, and must conform to the following specified percentages:

Class.	Silicon. Per cent.	Phosphorus. Per cent.	Man- ganese.		Sulphur.		Total carbon.	
			Not over	per cent.	Not over	per ct.	Not over	per ct.
1.....	1.50-2.00	0.20-0.75	1.00		0.04		3.00	
2.....	2.00-2.50	0.20-0.75	1.00		0.035		3.50	
3.....	2.50-3.00	0.20-0.75	1.00		0.03		3.50	
4.....	2.00-2.50	1.00-1.50	1.00		0.04		3.50	
5.....	4.00-5.00	0.20-0.80	1.00		0.04		3.00	

Sampling.—In all shipments received each carload, or its equivalent, shall be considered as a unit. At least one

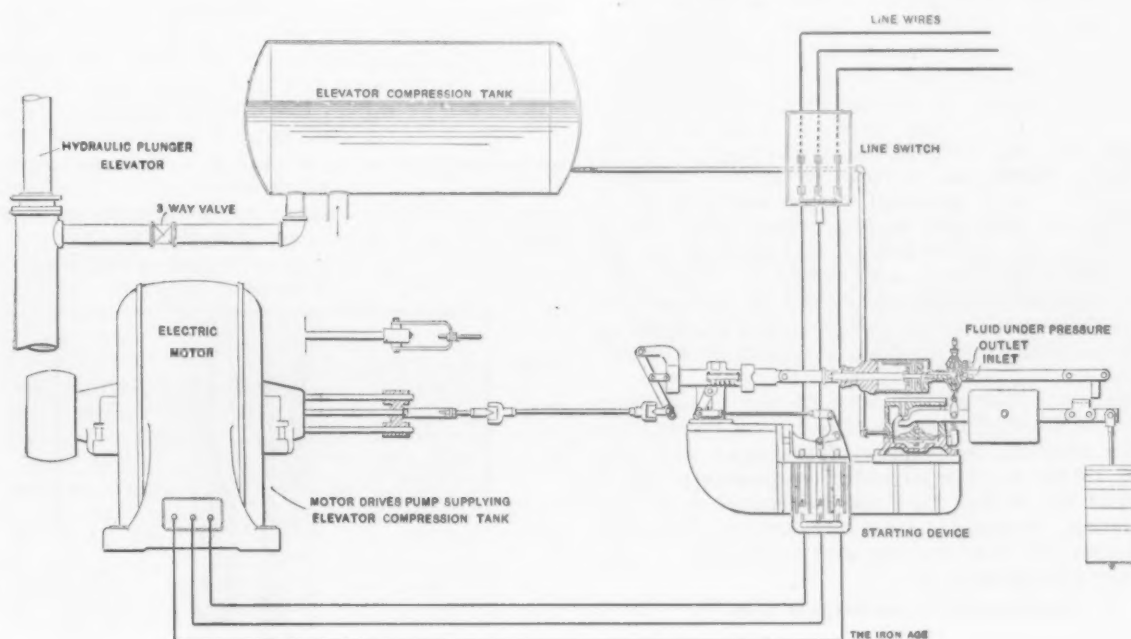


Fig. 2.—Diagram of the Electrical and Mechanical Connections for the Automatic Starter.

ratus in connection with power pumps where the conditions render it adaptable. A starting device of practically the same arrangement has also been applied to the General Electric Company's form M motor, which has a special external resistance.

Boring Machines for New York Tunnels.—Four of the machines to be used in boring under the Hudson and East rivers for the New York tunnels of the Pennsylvania Railroad have been under construction for three months at the Leedsdale shops of the Riter-Conley Mfg. Company, Pittsburgh. These machines are of unusual construction and to make them special air driven tools for the boring and reaming of the steel had to be made. The boring machines consist of cylinders of steel 24 feet in diameter and 16 feet long. Each cylinder, without the machinery, weighs 150 tons, and the latter will weigh equally as much. The cylinders are made up of three thicknesses of $\frac{1}{2}$ -inch steel plates riveted together. Within the cylinders are placed the boring edge of cast steel, the diaphragms, air locks and other apparatus necessary to drive the tunnel beneath the river. The steel cylinder moves with the cutting edge. Four of the machines were necessary to start work at both sides of each river. Some of the machinery, which will be made in the East, will be sent to Pittsburgh to allow the assembling of the machines in the Leedsdale shops, where all of the work will be finished, including the drilling and riveting. The apparatus will then be knocked down for shipment to New Jersey, where the boring plant will be assembled. The cylinders

pig shall be selected at random from each 4 tons of every carload so as to fairly represent it. Drillings shall be taken so as to fairly represent the fracture surface of each pig, and the sample analyzed shall consist of an equal quantity of drillings from each pig, well mixed and ground before analysis.

Rejection.—The company reserves the right to reject any portion or all of the material which does not conform to the above specification in every particular, and to return the rejected material to the manufacturer or seller for full credit at price charged f.o.b. point of delivery specified by the purchaser. If the material is to be replaced a new order will be entered at prices, terms and conditions acceptable to the purchaser.

The use of Serve, or ribbed, tubes in boilers, which is well known among marine engineers, is obtaining a foothold in the French railway service, owing to the fact that limitations due to bridges and questions of efficiency militate against longer boilers. A long series of practical tests appears to show that the ribbed tube gives an equivalent evaporation about two and one-quarter times that of the ordinary smooth tube of the same size. The heating surface for the tubes used was 1.18 square feet per lineal foot of the Serve tube and 0.92 for the smooth tube, thus showing an increase in favor of the ribbed tube of nearly 30 per cent., while the increase in efficiency was much greater. The cost of the Serve tube is about two and one-half times that of the others, but the cost per pound of water evaporated does not vary much.

The Fremont Method of Determining the Fragility of Iron and Steel.*

BY THORSTEN Y. OLSEN, PHILADELPHIA.

In this paper I will endeavor to explain the Fremont method of testing iron and steel. My knowledge of the subject is based mostly on translations which I have made from the French of Mr. Fremont's many papers to the Society for the Encouragement of the National Industry, together with a personal acquaintance with Mr. Fremont at Paris in 1900. In addition I have been able to make various experiments on one of the Fremont machines at the laboratory of Tinius Olsen & Co.

To fully explain this new method and machine it is necessary to give the reasons for the desire for a new method, the comparison with other methods, and results obtained by this new method unobtainable in any other manner.

Changes in Methods of Testing.

For several centuries past methods of testing have undergone considerable changes; thus in the seventeenth and eighteenth centuries the test by a blow was considered as the foremost and hardest test for a steel to undergo. No exact means, however, was known at that time for determining the force of the blow, and hence the test was in a crude and uncontrollable form. The test by tension was also used at this time, but only became known as the principal form of testing after the middle of the nineteenth century. Thus, according to Mr. Fremont, the test of tension owes its great growth to research work on iron and steel by David Kirkaldy in 1860, together with the development of the Bessemer steels. From this time the test of tension increased in importance, while that of shock or impact, as a factor, lessened.

With tension testing definite results may be obtained; in fact, the standard machines of to-day are by far more accurate than the homogeneity of the metal warrants. To-day all the formulæ on which engineering problems are based are derived from results obtained from tension testing. Standards have consequently been adopted for various materials, varying with the known stresses they may be subjected to.

Desirability of an Impact Test.

Due to the lack of homogeneity of a steel and to the unknown stresses which must frequently take place, factors of safety are stipulated; thus, if a boiler, rail or other structure is designed properly it should break only by an unknown fault in the material. Accidents occur; but should they be called accidents when possibly they might be avoided? The defects in the steel are either lack of homogeneity or excessive fragility or both. While the manufacturer has been plodding on, testing his material as required, being then safe from further responsibility or criticism, the scientist has been endeavoring to obviate, to the best of his knowledge, these two faults of steel. The first fault, that of lack of homogeneity, may be eliminated only slightly by making a greater number of tests; the second, by an impact or shock test. To-day there is an impact test prescribed for a rail; why not for a boiler plate, wheel tire or any portion of a mechanism subjected at some time or other to an abrupt or intermittent stress?

The "fragility" is a known factor as far as the knowledge of its existence, but no further. Through lack of method, machine and standards, the consumer and the producer have alike been compelled to ignore the fragility of their steel. Mr. Fremont, intent on relieving this state of affairs, and being in a position to fully investigate various methods of testing, commenced a series of investigations to determine the best means of testing for the fragility of steel.

Fremont Test Specimens Very Small.

In France, testing as done in this country is looked upon as an extravagance, and only the largest companies can afford a moderate size testing machine. The

cost of the material and preparation of tension test pieces are also considered a great expense, and hence Mr. Fremont, considering this together with the desire of testing portions of plates nearest to the portion actually used, and of testing thin plates, made his test specimen very small throughout his various experiments; thus, his specimens are 10 mm. (0.39 inch) wide by 8 mm. (0.314 inch) thick and 30 mm. (1.18 inch) long, with a notch cut crosswise in the center of one of its broad sides, 1 mm. (0.039 inch) wide by 1 mm. deep.

By comparing tests effected by rupturing specimens by a repetition of blows and by a single blow Mr. Fremont found that some steels ruptured by a single blow required but one-third to one-fourth the amount of work required by the repeated blows, and thus impact testing employing a repetition of blows is little better than a bending test. Steels appearing nonfragile by the first method would appear fragile when subjected to a single drop of a hammer just sufficient to break the bar.

As the shock test varies with the speed of impact and the deformations become smaller, the fragility slightly shown in the bending test will appear in its true form in the impact test. The rate of molecular transmission of force through a steel may be one way of defining this fragility. It is also a fact that for the same steel this rate approaches a limit independent of the speed of impact when twice that sufficient to rupture the specimen.

Registering the Work Required to Produce Rupture by Shock.

Knowing the desirability for an accurate and easy means for shock testing, Mr. Fremont presented a communication to the Academy of Science in 1897 proposing

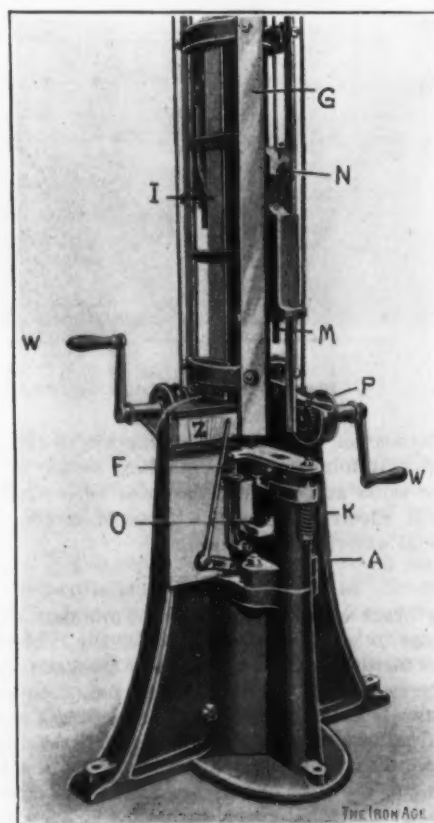


Fig. 1.—The Fremont Machine for Determining the Fragility of Iron and Steel.

a method of registering the amount of work required to produce rupture by this means.

As the speed of impact is a great factor, it is necessary to make the speed of the hammer sufficiently great to rupture the specimen with one blow, whatever the quality of the metal. If a steel then proves nonfragile to a drop of this kind it has been proved nonfragile to the test of a cannon. To determine the amount of work absorbed to produce this rupture it is necessary to measure the residual work that is possessed by the hammer after rupture of the specimen. After numerous tests by

* Abstract of a paper read December 3 before the Engineers' Club of Philadelphia, and March 1 before the Philadelphia Foundrymen's Association.

shock Mr. Fremont finished a machine embodying principles by which this residual force could be measured. First, "crushers" were employed from which the residual force in the hammer could be measured from their known compression; this, however, was not very practical, and so in the commercial machine a set of springs is used to measure this residual force.

The machine as built to-day is shown in Fig. 1. This figure represents the lower portion of the machine. The design is made double—i. e., it is arranged so that two may operate on the same machine at the same time. The base of the machine is composed of two parts connected by bolts. Between them, and held tightly by them, is a central I-beam marked I. This carries six cast iron supports at intervals, to which are bolted the four rolled steel guides marked G. Two anvils are bolted on opposite sides of the base, the whole weighing more than 1500 pounds. The weights of the hammers are 20 and 30 pounds, or about one-seventieth the total weight of the machine. The anvils marked A contain in front and in back of the matrix vertical cylindrical holes serving for the lodgment of two springs. A cap of hard steel is placed directly over them. It is this cap, or platform, which receives the hammer after the rupture of the specimen.

The hammer compresses the springs and the space traversed by them is then measured. As the springs rebound after the blow it violently repels the cap, and so to offset this new shock the cap is held by two small springs, one of which is visible on the front of the anvil at K. These springs thus serve merely as a deadener to the cap when rebounding.

On each side of the base and to the right of the operator is a windlass marked W, by which the hammer is easily and quickly raised. A ratchet and lever placed at P prevent the downward motion of the hammer when placing the specimen in position.

Each hammer has inserted at its lower extremity a hardened steel punching tool, as at M. A gripping device at N holds the hammer to the pulling cord until automatically released at the top of the machine.

To operate the machine we first raise the weight enough to allow room to place the specimen in position, notch side down, with notch directly in the center of the die. Then we turn the windlass, raising the weight to the top, where it is automatically released, and, falling, breaks the specimen, which in turn falls through the die into the pocket at the side of the machine. Having broken the specimen, it is necessary to measure the work required to cause the rupture. The cap covering the springs pushes down a light steel tube at F, which is held by friction so as to give an accurate measurement of the deflection of the springs. This deflection is further multiplied by the aid of the instrument shown at Z.

To calibrate the machine the hammers are raised through successively increasing intervals of height and dropped on the platen covering the springs. Corresponding marks are placed on the card of the instrument, as shown. Thus, the machine can readily be calibrated at any time with about ten minutes' work. Let us now summarize

The Advantage Obtained by This Method and Machine.

1. The method, by using small specimens, reduces the cost of test pieces and their preparation, thereby furthering the great production of tests and thus aiding in establishing a standard homogeneity test.

2. The small specimen permits of testing thin plates, both with and across the rolling, as well as the possibility of testing parings or clippings from actual material used or those nearest to any section subjected to the greatest known stress.

3. The machine affords an accurate method of measuring the work necessary to produce rupture under standard conditions, always maintaining the same speed of impact. The machine as manufactured in this country will have a standard drop of 13 feet with hammers weighing 20 and 30 pounds, as these are the nearest English units to that used in the metric system.

The specimen will be $\frac{3}{8}$ inch wide, 5-16 inch thick

and $1\frac{1}{4}$ inches long, with a saw cut 1-16 inch deep. The die is 13-16 inch wide. The machine can be shifted from the one standard to the other without any material change. The specimens may be prepared either by hand or in quantity, by a small machine constructed for the purpose.

To determine the influence of the dimensions of the notch on the results of the tests Mr. Fremont made three series of tests: 1. With depth equal to the width; 2. width equal to twice the depth; 3. depth equal to twice the width. In the bending test he found that double the width required the same maximum force to commence the rupture, but required more work to complete the same. Double the depth required less force to commence the rupture.

Making these same tests by the drop of the hammer, Mr. Fremont found that a small variation in width was not discernible, and only the case of double the depth created a difference in the results. The more fragile the steel the less important would be a small variation in the size of the notch. Results obtained by the Fremont drop test, compared with the other forms of testing, have been tabulated by Mr. Fremont, from which it is readily seen how fragile some steels are to shocks while differing but little in the tension test, while steels passing the bending test also fail when subjected to the drop test.

Fig. 2 represents a section of a rail showing the method of cutting out Fremont specimens from the en-

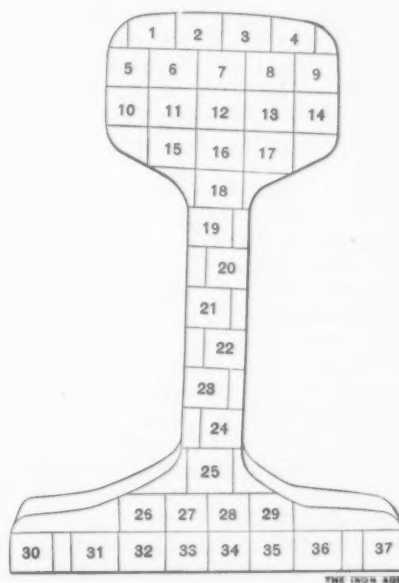


Fig. 2.—A Steel Rail Section Cut Into Small Pieces for Fremont Tests.

tire section. Thus, any rolled form can readily be tested to determine the effect of the rolling on any portion of it. The rail after the test appears as shown in Fig. 3, the pieces bent having been subjected to the bending test, while those appearing broken abruptly were tested by shock.

The Fremont method and machine received the gold medal at the Paris Exposition in 1900 and were discussed at the International Testing Congress in session at that time.

Discussion by the Engineers' Club.

James Christie: It has long been believed by many inspectors that the ordinary tension test does not always disclose the fragility of defective steel. Instances are known where untrustworthy material has behaved in a satisfactory manner under tensile test. It has been asserted that this faulty material would show insufficient ductility if submitted to impact tests. It is true that the experiments of Professor Hatt at Purdue University showed satisfactory ductility under impact, but this might not have occurred with defective material. When the falling weight or height of fall is varied in drop tests it is inconvenient and difficult to establish any exact comparison under these varying conditions, but the

Fremont method of maintaining a constant weight and height of fall, and measuring the residual energy of the drop after fracture of the specimen, is interesting and promising.

The President: Would the depth of the saw cut in the sample make considerable difference?

Mr. Olsen: Yes; slight variations in the depth will make slight differences in results, the difference being more noticeable on better material. This was explained in the latter part of the paper by Mr. Fremont's experiments on that particular point in question.

The President: Suppose some specimens turned out to be very good in testing them with this machine, for what purpose would such steel be most useful? In other words, just what good qualities would such a test show?

Mr. Olsen: I think if a steel would answer the Fremont test it would be the steel for any class of work or any purpose. A steel should be tough. A steel can be hard, still not fragile. All machine tools, cutting tools or structures are some time or other subjected to shocks or intermittent stresses. Mr. Fremont took rails or boiler plates as examples; he also made tests on some conduits and on steel bars for structural work, which broke, due to their fragility, thereby causing great damage. Accidents of this nature influenced Mr. Fremont to continue his great research work along this line.

The President: Boiler plates are not subjected to sudden blows like a rail.

Mr. Olsen: I do not know exactly what occurs in the boiler to cause the explosion which fractures the plates. Since so many boilers fail through fractured plates, it is plausible that some shocks or equivalent must occur. The great variations in the pressure and temperature stresses alone might be termed a repeated stress and as damaging to a steel as a sudden heavy blow, causing the rupture just as surely, only in a greater length of time.

The President: Would not the relative results between a number of specimens be quite different, depending upon the height from which the weight is dropped? In other words, if one person had a machine in which the drop is 13 feet, as I believe it is in this machine, and he tested a lot of materials and arranged them in their order of merit; then if another person used a machine in which the drop was perhaps twice as great, would not the relative order of those same specimens turn out differently in the second case than in the first, because the rapidity of the blow is quite different?

Mr. Olsen: The height is to be kept a constant. That is one of the essential points of this method. Mr. Fremont made some experiments and found that if the height of fall were possibly twice or more times as great as that necessary to produce rupture of the specimens a further increase in height would not vary the results of the test. A limit seemed to be reached where the rate of transmission of the forces through the molecules would not change. Thus, in the example before mentioned, since the height of fall in this machine was experimentally determined as beyond the limit in question, a height three or four times as great would not change the results of the test; but a great decrease in height, on the other hand, would make considerable variation.

The President: In either case the specimen must be broken?

Mr. Olsen: The specimen is broken in every case. The machine is provided with two sizes of hammers, so that if the hammer on the one side is insufficient to cause rupture the other is resorted to. The speed of the two hammers is practically the same, but slightly greater for the heavier hammer. Beyond the limit before mentioned the results as obtained with either hammer should be the same.

To calibrate the machine I measured the column off in feet and raising the hammer let it drop successively from the height so marked off, inscribing a mark on the dial plate of the instrument after each fall. This marking was verified by dropping the hammer from the same height several times and noting that the mark came to the identical place each time. The needle on the instrument is not in contact with the moving parts of the machine

during the test. After the test is completed the needle is moved until its lower extremity makes contact with the tube compressed by the platen covering the springs; thus there is no inertia to be considered as regards the action of this pointer during the test. The pointer is so constructed that it falls away from the tube, and is only in contact with the tube when held so by hand for the purpose of measurement.

George M. Sinclair: For testing a wide range of material it would seem to be necessary to vary the falling weight if the height through which it drops is maintained constant. Perhaps eventually each material will be tested by a specific weight and height adopted as standard for that material. The use of springs suggests trouble, and it would seem desirable to be able to change them readily and also to calibrate them frequently. I presume they can be tested in position by dropping

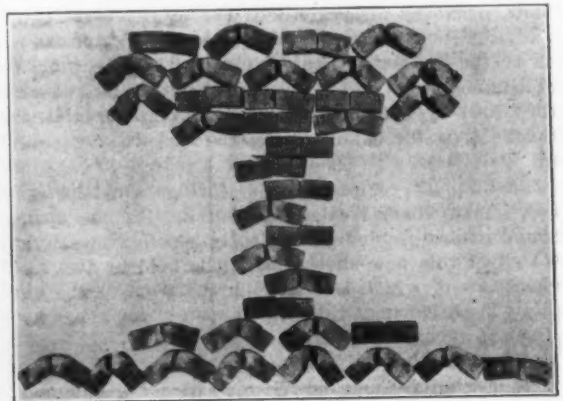


Fig. 3.—The Pieces of Rail Tested by the Fremont Method.

the hammer directly on them through known heights, say at every foot of height. With springs which are known to be correct, on the other hand, the readings of the registering apparatus can be calibrated. I should like to inquire how close you can read—that is, the sensitiveness of the machine, and also its accuracy.

Mr. Olsen: Mr. Fremont claims an accuracy of between $1\frac{1}{2}$ and 3 per cent. As far as calibrating goes, that is very easy. All you have to do is to raise the weight to different heights. You can do that in five or ten minutes' work. You ought to be able to make a good many tests.

The Blair & Young Company, Pittsburgh, a corporation recently organized under the laws of West Virginia, with a capital of \$100,000, will erect a building 80 x 200 feet adjoining the plant of the Youngstown Car Mfg. Company, Youngstown, Ohio, for the manufacture of industrial steel cars. The company has also let contracts for a new power house to accommodate a plant of about 200 horse-power for the operation of foundry and machine shops of the Blair & Young Company and the Youngstown Car Mfg. Company. The officers of the new company are George T. Oliver, president; A. C. Blair, vice-president, and John P. Young, general manager. The Youngstown Car Mfg. Company will be operated as a separate corporation, but under the same management as the Blair & Young Company.

The new Hippodrome now being erected in New York City will be the largest amusement enterprise of the kind in the world. It is to be under the management of Thompson & Dundy, the proprietors of Luna Park, Coney Island, and will occupy the corner bounded by Forty-third and Forty-fourth streets and Sixth avenue. The electrical equipment of this building is of interest, as it will comprise some 17,800 incandescent lights and more than 200 horse-power in electric motors. The façade is to be outlined in incandescent lamps, and large signs are to bring forcibly to the attention of the passing public the purpose of the building and the attraction then being presented. The entire service is to be supplied by the New York Edison Company.

The Scottdale Coke Oven Larry.

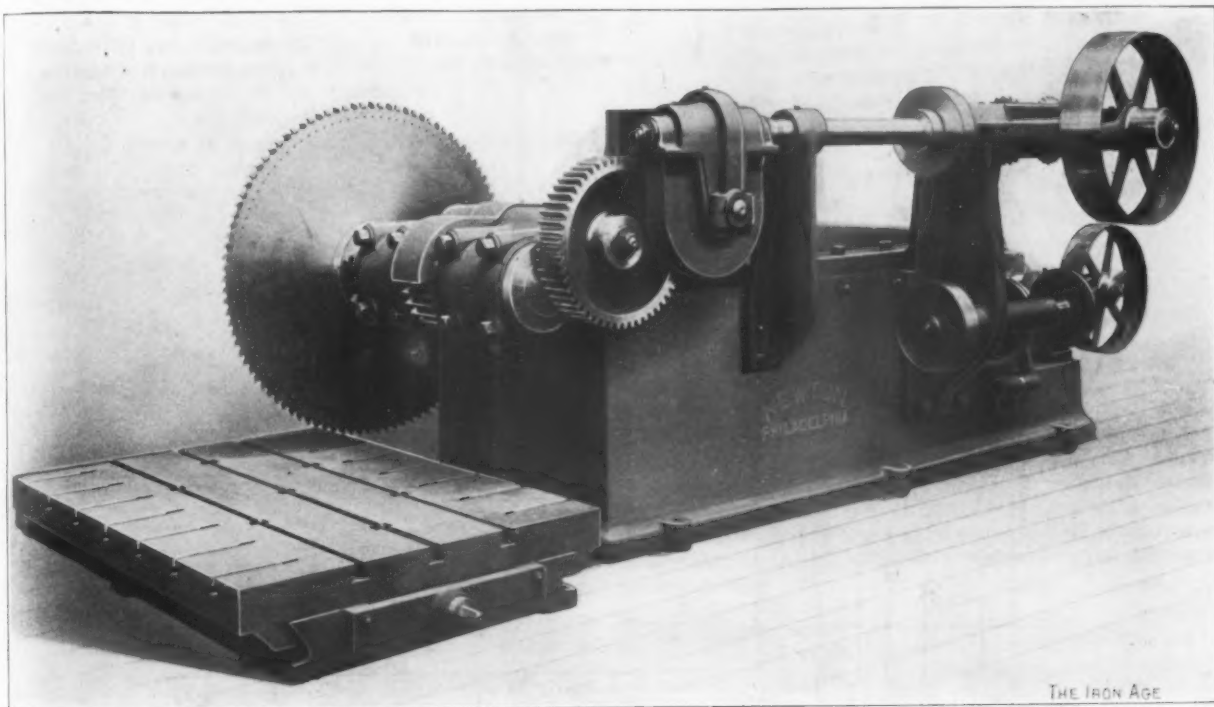
The larry illustrated herewith is used for charging coal and coke ovens and is manufactured by the Scottdale Foundry & Machine Company, Scottdale, Pa. Owing to the severe and continuous service to which it is subjected it has been designed with a form of support which is a distinct improvement on the old steel trestle work frame, being considerably lighter, yet much more rigid. It is firmly secured together with angle irons and stiffened where necessary by flat iron braces inside to give it the necessary strength. When electrically equipped, the more or less delicate electrical apparatus,

March, 1904. Unless Congress seriously curtails appropriations for new ships the United States will shortly take from France the second position on the list of powerful navies.

A Large Newton Cold Saw.

A large cold saw cutting off machine, especially adapted for steel foundry work, is shown in the accompanying half-tone, being a design recently executed by the Newton Machine Tool Works, Philadelphia, Pa.

The spindle of this machine is 8 inches in diameter in the front bearing and 7½ inches in diameter in the



A Large Cold Saw Cutting Off Machine, Built by the Newton Machine Tool Works, Philadelphia.

such as rheostats, switches, &c., is placed inside of the legs, where it is protected from the weather and acci-



Coke Oven Larry, Built by the Scottdale Foundry & Machine Company.

dental damage. These laries are built in all sizes and styles usually demanded in the coke region and also to be used for transferring coal in yards or coal depots.

According to a Parliamentary return recently issued, the aggregate naval expenditure of the Powers last year was: England, \$172,000,000; the United States, \$81,000,000; France, \$61,000,000; Russia, \$60,000,000; Germany, \$50,000,000; Italy, \$23,000,000; Japan, \$11,000,000, and Austria, \$10,000,000. The figures for Japan do not include the present war, as they are for the year ending

back bearing, and the combined length of the bearings is 31 inches. The saw blade is 50 inches in diameter, and is secured to a flange on the end of the spindle, which is 15 inches in diameter. The saw is fitted with inserted teeth and is capable of cutting off gates and risers up to 17 inches cross sectional diameter. The gearing transmitting the drive from the driving pulley to the saw is plainly indicated in the engraving. The driving pulley is connected with the driving shaft through bevel gearing, so that the machine can be belted directly when placed at right angles to the line shaft. The other end of the driving shaft carries a steep lead hardened steel worm driving a phosphor bronze worm wheel, and a pinion on the same shaft with the latter drives a spur gear on an intermediate shaft, carrying a pinion meshing with a spur gear on the spindle.

The ram has an automatic feed of 30 inches, the speed of which may be varied through a friction disk and power quick return. The power quick return of the spindle head is independent of the drive, so that the saw blade may remain idle when being withdrawn from the work. The machine is furnished with a work table 6 feet long by 4 feet wide, which has an adjustment of 6 inches at right angles to the saw blade for convenience in setting work. The machine weighs about 28,000 pounds and was shipped to one of the large steel foundries in the Pittsburgh district.

The report that the National Tube Company will build a new tube mill at Versailles, near McKeesport, Pa., is untrue. The statement arose from the fact that certain departments will be moved from the National Works at McKeesport to Versailles, where the National Galvanizing Works are located, to make more room for the large extensions now being made to the National Works at McKeesport.

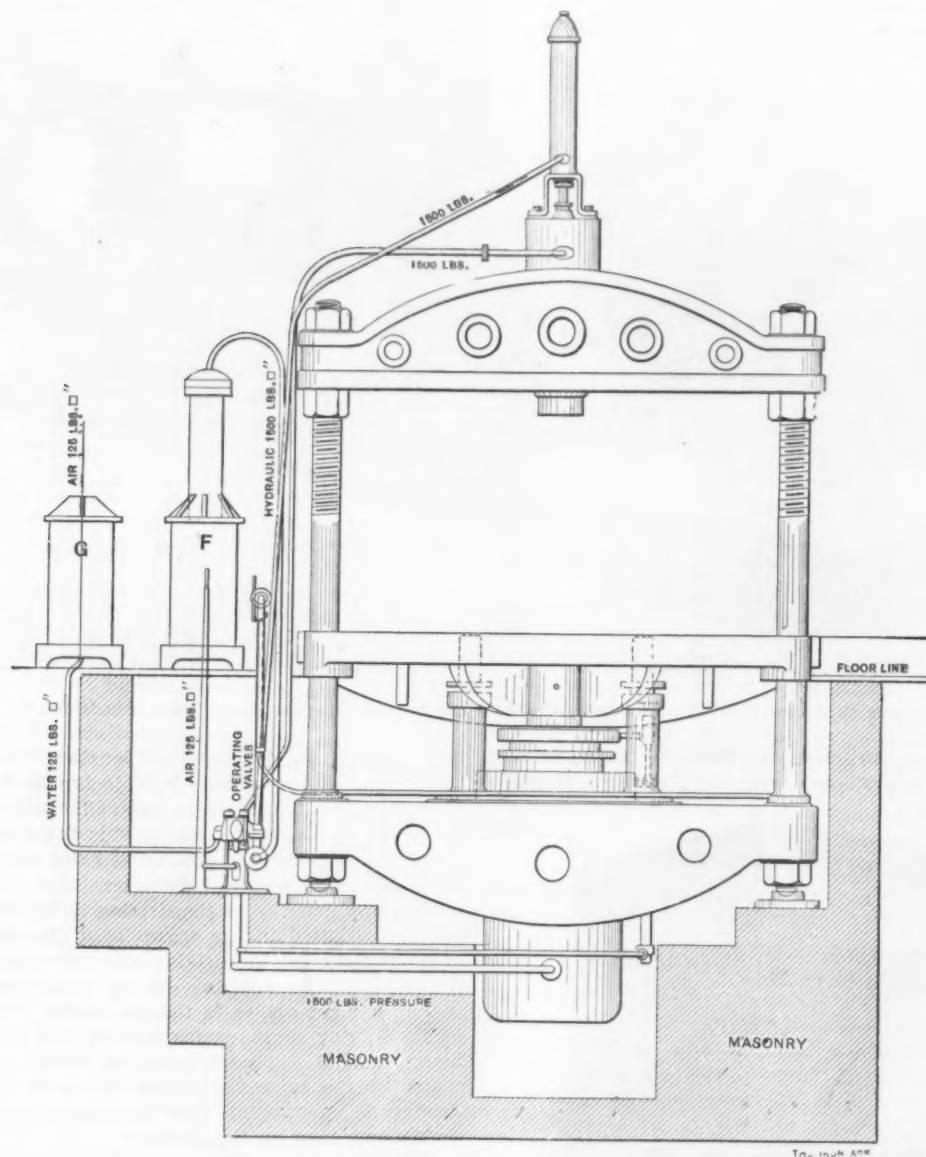
A New System for Operating Hydraulic Machinery.

A new arrangement for working hydraulic presses, punches, riveters and forging machines has been invented by William H. Wood, Media, Pa. Its application to a flanging press is illustrated herewith, showing a 550-ton cylinder for operating the platen, a 110-ton internal clamping cylinder, a 160-ton cylinder in the head of the press, and four 6-inch auxiliary jack clamping rams. The main plunger on the press has a 48-inch stroke, and the plunger in the head has a 36-inch stroke. Hydraulic pressure is applied through the medium of the differential F and the low pressure reservoir G, which are controlled by

with accumulators and hydraulic pumps can be dispensed with. It is said that the machine can be operated with just as good results as from an accumulator and pump, and without the shocks which usually attend the older arrangement.

For putting the pressure on the water air pressure at 125 pounds is used, which is now commonly available in any boiler shop or bridge works. The tools previously enumerated can all be operated simultaneously from the compressor, which would deliver, say, 1000 cubic feet of air per minute. However, as all the machinery would seldom be in operation at one time, only a portion of this quantity of air would be required.

In working the press under this system, as compared



The Wood System Applied to the Operating of a Flanging Press.

hydraulic valves of a form manufactured by the inventor. A striking advantage is that each of the cylinders in the press can be operated by an ordinary three-way cock, instead of costly valves which are ordinarily used for hydraulic machinery when operated from accumulators and pumps.

This same system has been applied to a number of other machines, including the following: An 18½-foot gap riveter with multiple cylinders for putting variable pressure on the rivet from 30 to 150 tons and a plate closer of 30 tons capacity; a 60-inch punch which will punch 4-inch flue holes through 1¾-inch plates, and three other hydraulic punches and a shear of varying capacities. This machinery, it has been found, can be worked without hydraulic pumps or accumulators by a series of differentials, and the operating valves and high pressure mains for conveying the water which are usually used

with the accumulator and pump system, one great advantage is that the platen may be moved from the low pressure water reservoir with the 125 pounds pressure due to the air on top of the water until the high pressure is required for the effective stroke, which is usually only about 30 per cent., or even less, of the stroke. In the accumulator system the whole movement of raising the table until the work is accomplished would have to be done with 1500 pounds pressure; consequently, there is a large saving in the new arrangement, where one-twelfth of the maximum pressure can be used for practically 70 per cent. of the movement of the table.

The Mexican Government has compiled statistics showing that there are only 39 iron foundries in operation in Mexico.

Some English Grinding Machinery.

The accompanying illustrations, Figs. 1 to 9, show a few of the principal types of grinding machines lately brought out by B. R. Rowland & Co., Limited, Riddish, near Manchester, England. The most distinctive and striking features of these machines as a class are the self oiling, dust proof bearings, which are extra long and of large diameter, and driving pulleys, which are extra wide and of large diameter.

Fig. 1 shows a grinding machine intended for light work and suitable for mounting upon bench or upon a pedestal, as illustrated. In this form it can be installed in any position where a bench is not convenient. These machines are made in three sizes, running respectively at 2200, 1700 and 1450 revolutions per minute, the driving pulleys being respectively $4 \times 2\frac{1}{2}$, $5 \times 3\frac{1}{4}$ and $6 \times 3\frac{1}{4}$ inches, and the emery wheels $9 \times 1\frac{1}{4}$, $12 \times 1\frac{1}{2}$ and 14×2 inches.

Fig. 2 shows a heavy floor grinding machine un-

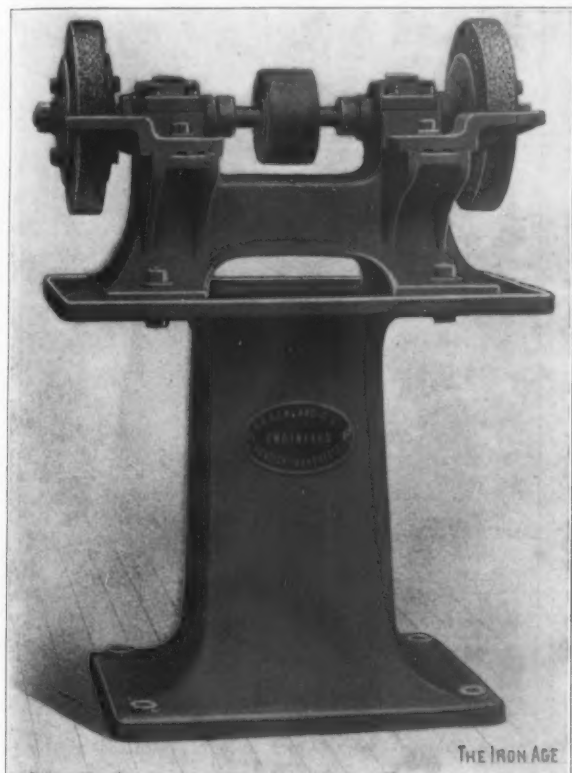


Fig. 1.—A Light Dry Grinder to Be Mounted Either on a Bench or as Shown.

usually substantial and suitable for the heaviest class of foundry and machine shop grinding. It is especially adapted for use in iron and steel structural works, bridge and ship yards and wagon and boiler shops to grind girders, angle bars, plates, &c. The emery wheels are mounted upon steel spindles of large diameter, having long bearings, furnished with self lubricating oil rings. These machines are built in four sizes, the largest one weighing 3500 pounds and the smallest one 1750 pounds. The driving pulleys for the four sizes are respectively $12 \times 5\frac{1}{4}$, $12 \times 5\frac{1}{4}$, $14 \times 6\frac{1}{4}$ and $16 \times 7\frac{1}{4}$ inches; the emery wheels 30×4 , 36×4 , 42×6 and 48×6 inches, and the speeds 660, 550, 470 and 410 revolutions per minute.

Fig. 3 shows a bench tool grinder designed to grind small tools of all kinds. As the emery wheel runs in water, the grade of wheel varying to suit the kind of work to be done, all danger of drawing the temper from hardened tools is avoided. Being entirely incased, except where the grinding is done, no water flies off. A special emery wheel was adopted which by reason of its porous nature is constantly moist. The machine occupies only 22×12 inches of bench space in the size illustrated. The various sizes in which it is made weigh from 85 to 132 pounds, run at from 1250 to 850 revolutions per minute and have wheels from 10×1 to 14×2 inches.

In Fig. 4 is shown a single wheel tool grinding machine designed for general work of all sizes. The wheel is mounted upon a cast iron stand and trough combined with rests for supporting the tools while being ground. A strong shield, or hood, incloses the emery wheel, and a centrifugal pump driven from the emery wheel spindle forces the water from a reservoir inside the column

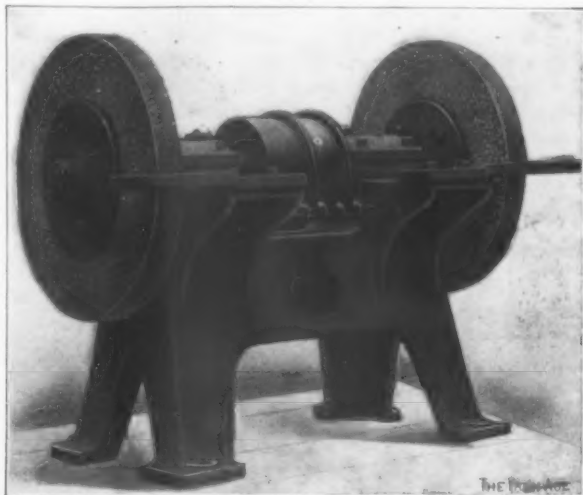


Fig. 2.—A Heavy Double Floor Grinder for Dry Grinding.

and delivers it on the grinding wheel. The rest is adjustable to allow for wear of wheel, as are also the leaves for retaining the surplus water. The emery wheel spindle is made of steel fitted with self oiling bearings. The machine can also be fitted with a reducing gear for turning the emery wheel slowly when there is occasion to true it. The emery wheels in the different sizes of these machines range from 14×2 to 42×3

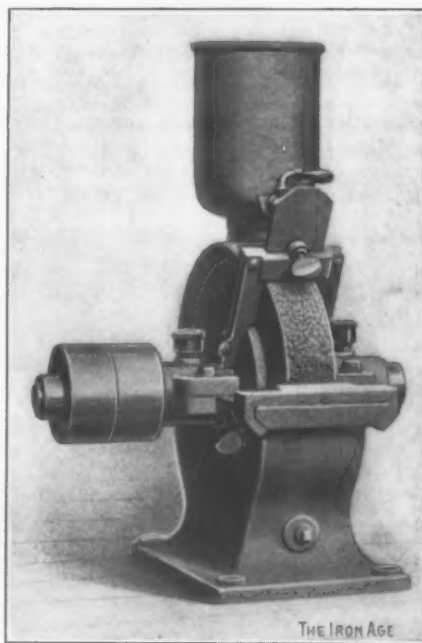


Fig. 3.—A Small Tool Grinder for the Bench.

inches, the speeds from 850 to 300 revolutions per minute and the weights from 500 to 1900 pounds.

Fig. 5 shows a double tool grinder, the features of which are essentially the same as those in the single wheel grinder just described. It is made in sizes weighing from 1150 to 4000 pounds.

The floor grinding machine shown in Fig. 6 is designed for general light work, being a modification of the form shown in Fig. 1. It consists of a strong cast iron stand carefully bored and fitted with long bearings of large diameter. The weights of the three sizes of these machines are 350, 541 and 581 pounds, respectively; the speeds 2200, 1700 and 1450 revolutions per minute; the

sizes of driving pulleys $4 \times 2\frac{1}{2}$, $5 \times 3\frac{1}{4}$ and $6 \times 3\frac{1}{4}$ inches, and the sizes of emery wheels $9 \times 1\frac{1}{4}$, $12 \times 1\frac{1}{2}$ and 14×2 inches.

The tool grinder shown in Fig. 7 is specially designed for wet grinding and sharpening wood working

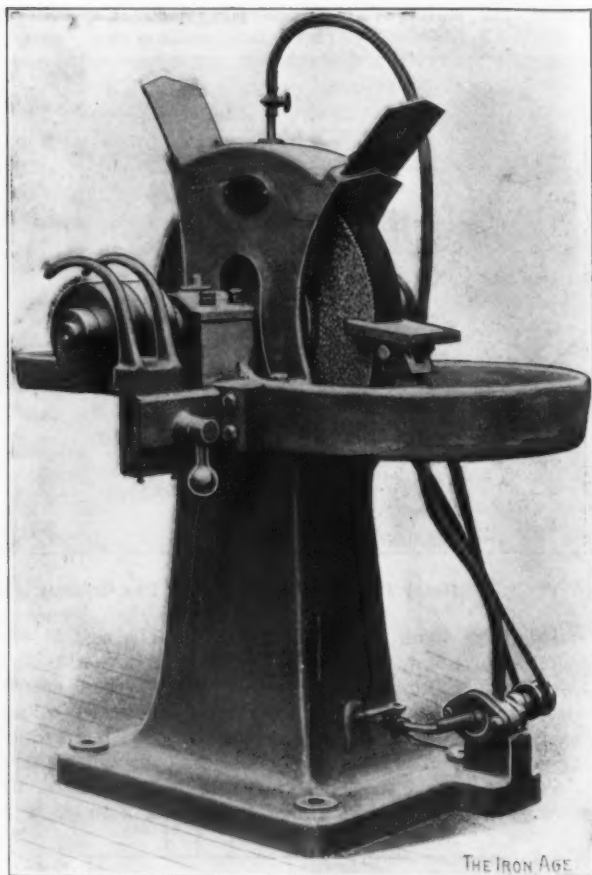


Fig. 4.—A Single Wheel Protected Wet Tool Grinder.

tools, such as inside and outside gouges, chisels, plane blades, molding machine and planing machine knives, &c. It consists of a substantial stand fitted with a steel spindle $1\frac{1}{2}$ inches in diameter, the center of which is

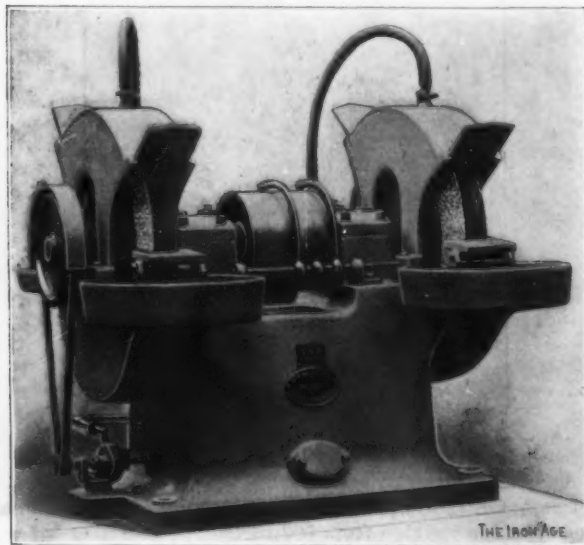


Fig. 5.—A Double Wheel Grinder Otherwise Similar to the One Shown in Fig. 4.

3 feet 9 inches from the floor. Upon the spindle are mounted five emery wheels, each 12 inches in diameter, but of different thicknesses, being $2\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{8}$ and $\frac{1}{4}$ inch thick, respectively. The edges of the four thinner wheels are rounded for grinding molding machine knives and gouges. The wheel with the 2-inch face is for grinding plane blades and flat chisels. At the end of the spindle

is fitted a fine emery face wheel and rest for whetting purposes.

Fig. 8 shows a twist drill grinder, for which the makers claim extremely simple construction and efficient operation. The drill holder is prevented from being forced against the wheel by an automatic stop. Measuring devices assist the setting of the drill holder to give exactly the clearance required. When fitted with the makers' corundum wheels drills may be dry ground without danger of drawing their temper. The opposite end of the spindle is fitted with a wheel for all grinding of a similar character where free hand support is sufficiently accurate. The size of driving pulley is $2\frac{1}{2} \times 2$ inches, the speed of emery wheel 1800 revolutions per minute and the weight from 75 to 180 pounds, according to the equipment.

Fig. 10 shows a polishing lathe designed for polishing and finishing of every description. The machine consists of a cast iron stand fitted with adjustable bearings, thus permitting the accurate running of the spindle un-

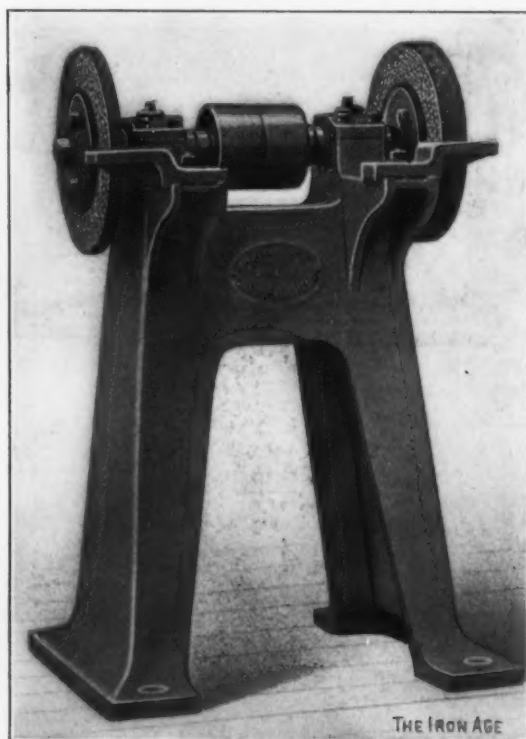


Fig. 6.—A Floor Grinder Which is a Modification of the One Shown in Fig. 1.

der all circumstances. The loose pulley runs upon a sleeve, which prevents wear of the spindle. The speed depends upon the size of the buffer or wheel used and of work being polished, varying between 1800 and 2000 revolutions per minute.

New Scherzer Rolling Lift Bridges.—The second Scherzer rolling lift bridge for the Central Railroad Company of New Jersey across Newark Bay, New Jersey, is rapidly nearing completion. This bridge is being erected in its closed position and constantly carries the railroad traffic without interruption. During the past month Scherzer bridges were completed and placed in active service at Eighteenth street, Chicago; South Michigan street, Buffalo, N. Y.; Swale River, England, for the South Eastern & Chatham Railway. During the present month the following additional Scherzer bridges will be completed and placed in active service: Union avenue, Third avenue and Hamilton avenue bridges, across Gowanus Canal, Brooklyn; also the long span double leaf bridge at Manhattan avenue, across Newtown Creek Waterway, Brooklyn. The double track, single leaf, long span Scherzer bridge recently completed and placed in service for the Newburgh & South Shore Railroad, Cleveland, Ohio, has attracted wide attention because of its simplicity and economy. It is being duplicated by the Baltimore & Ohio Railroad Company at Cleveland at an adjacent site, where a center pier swing bridge is being removed and

replaced. Orders for a number of additional single, double and multiple track bridges of similar form have been booked by the Scherzer Company, Monadnock Block, Chi-

Railroad at Buffalo, N. Y., has recently been awarded and work of construction is now in progress. Construction work is also in progress on Scherzer bridges at Twenty-

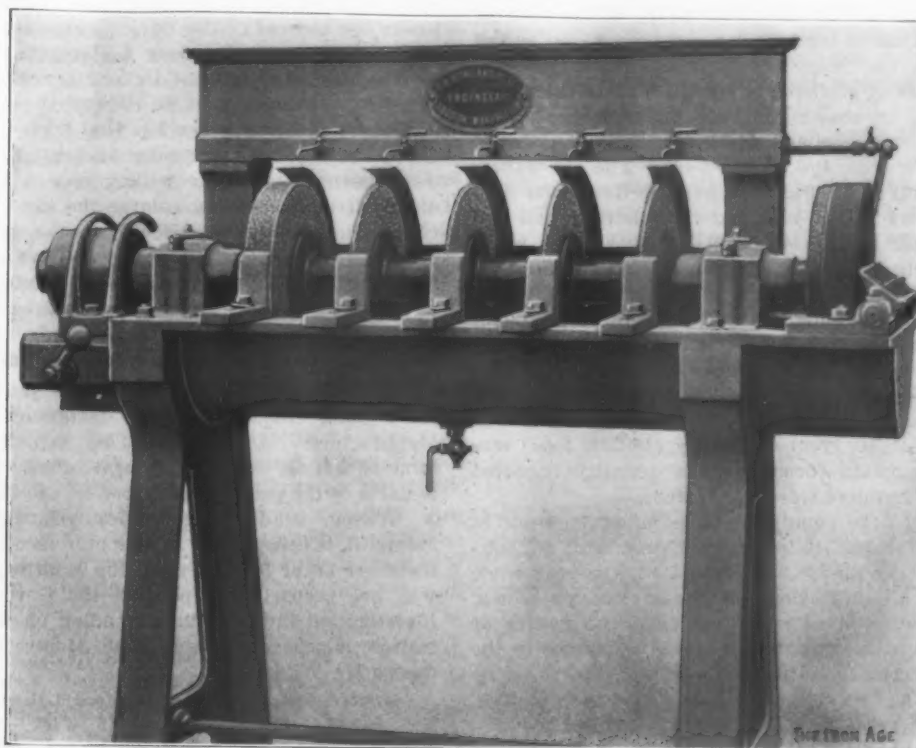


Fig. 7.—A Multiple Wheel Wet Grinder Specially Designed for Sharpening Wood Working Tools.

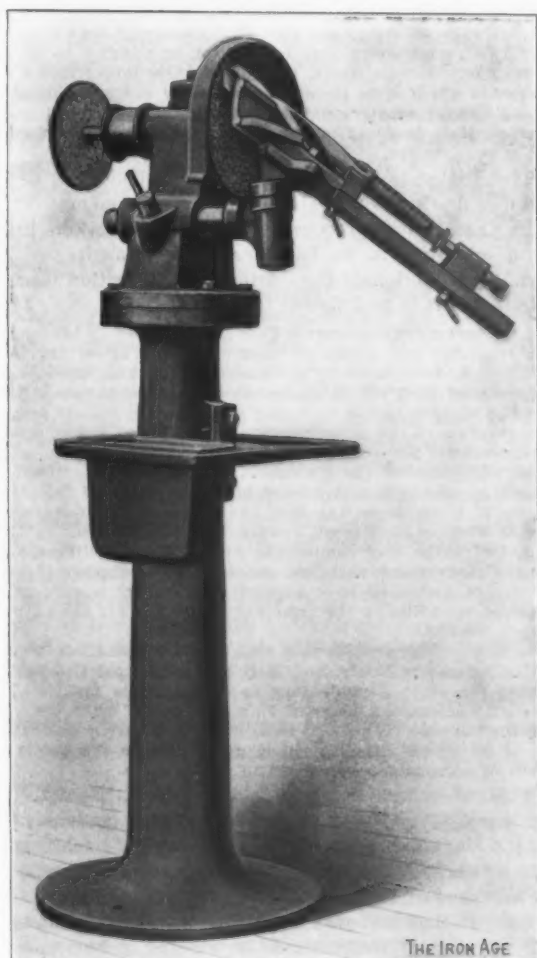


Fig. 8.—A Twist Drill Grinder.

cago, construction contracts to be let this year. The contract for the construction of the Scherzer bridge for the Buffalo & Susquehanna Railroad and the Pennsylvania

street, Chicago; Harrison street, Chicago; Flushing, Long Island; Genesee avenue, Saginaw; over the Suir River, Ireland; Spaarne River, Holland; Saugus River, Boston; Malden River, Boston; West River, at Kimberly avenue, New Haven; also four-track railroad bridges for the New York, New Haven & Hartford Railroad Company at Cos Cob, Conn.; Westport, Conn., and also across the Housatonic River, Connecticut. Among the foreign contracts on which the Scherzer Company is now working are a large highway bridge across the Ekaterinhofka River, St. Petersburg, and a deck bridge of arched outline, forming

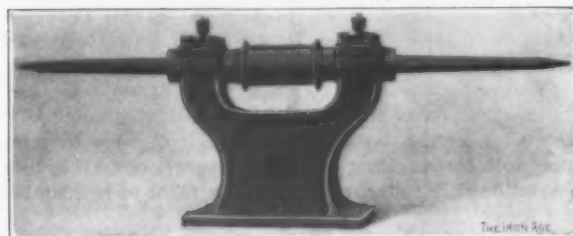


Fig. 9.—A Polishing or Buffing Lathe.

the movable portion of a long bridge connecting Barrow-in-Furness with Walney Island, England.

To ascertain the effect of pressure on magnetic induction a recent experimenter uses rings of iron placed in a box of iron having walls 2 inches thick. Resin oil is forced in and pressure applied to the inside by means of a screw plunger, the maximum being 18,000 pounds per square inch. With a steady field it is found that increase of pressure up to 16,000 pounds produces an augmentation of induction by from 0.5 per cent. to 3 per cent., varying with the primary field used. With a steady pressure it is found in general that for an unannealed specimen increase of field at first decreases induction by a total of about 1 per cent., and then gradually increases until the figure is about 1 per cent. greater than at first. With annealed specimens the initial decrease is about the same, but the recovery is not so marked. Hydrostatic pressure appears to alter the amount of residual magnetism.

Trade Events in Canada.

Mineral Production.

TORONTO, March 4, 1905.—A summary of the mineral production of Canada for 1904 has just been issued by the Geological Survey. A point which may be referred to before its tables of statistics are dealt with is the agreement between its showing of the pig iron production and the American Iron and Steel Association's showing as given in *The Iron Age* of this week. The association reports the total as 270,942 tons, and the Geological Survey reports it as 303,454 tons, but there is no actual discrepancy, for the association's unit is the gross ton, while that of the Survey is the 2000-pound ton. Of the total 303,454 net tons 68,297 net tons were made from domestic ore, the remaining 235,157 tons being the product of imported ore, the great bulk of which came from Newfoundland. Iron ore, however, was exported. The shipments to outside furnaces in 1904 aggregated 168,828 tons, valued at \$401,738. All of it went to the United States. A somewhat greater quantity (180,932 tons) was charged to Canadian furnaces. The quantity imported for Canadian furnaces was 454,671 tons.

The value of the country's whole mineral output in 1904 is placed at \$60,343,165, as compared with \$62,600,434 in 1903, and with \$66,339,158 in 1901, the year when the country's mines yielded the largest money's worth. The two million odd of shrinkage from the figures of 1903 is almost all accounted for by the difference in the two years' returns from the Yukon gold fields, these returns amounting to \$1,313,000 more in 1903 than in 1904. Gold from other sources in the country declined \$530,590 from the figures of 1903. The placers of the Yukon now being worked are less rich and less easily accessible than were those from which the outputs of the previous five or six years came. There was a lack of water to operate the mines of Nova Scotia. In Ontario there was little gold mining. British Columbia's placer output increased, but that from its lodes fell off. Throughout the remainder of the metal list there were marked changes from the returns of 1903. Here are the increases: Pig iron from Canadian ore, \$194,042; iron ore exports, \$16,811; lead, \$868,858; silver, \$418,217. The decreases from 1903 are as follows: Copper, \$139,368; gold, \$2,582,596; nickel, \$783,051; zinc, \$24,244.

The large increases under the heads of silver and lead are to be credited to the working of the new bounty law. Refined silver has been shipped from the Canadian Smelting Works at Trall, B. C., to New York, San Francisco and China. It is 0.999 fine. The lead output, though exceeding twice that of 1903, is still far below that of the high record yield of 1900. That year 31,584 tons were produced, whereas this year the production amounted to 19,000 tons. The falling off in nickel was due to interruption in the smelting of the ore, operations having been discontinued in order to allow a new plant to be installed at Copper Cliff.

Sault Falls.

In the House of Commons on Friday the Minister of Railways and Canals stated in reply to a private member that the officials of the Intercolonial reported that so far they found the rails of the Algoma Steel Company quite equal to any made in other countries. Provision was made in the estimates for the continuance of the work of double tracking the I. C. R.

A new high record of production was recently established at the rail mill of the Algoma Steel Company. In 12 hours 93 heats were blown, the output being 362 tons. This shows that the plant has a possible capacity of 724 tons per day, though it was intended to be a 500-ton mill. No efforts are being spared to get the Canadian Pacific Railway Company's 25,000-ton order filled as soon as possible. Superintendent Lewis says that another crane to strip the ingot molds and four more coking pits will be installed.

Tin Plate Project.

The promoters of the Canada Tin Plate & Sheet Steel Company, who are negotiating with the authorities of the village of Morrisburg, Ont., propose to establish eight mills at a cost of \$300,000 and to keep between

300 and 400 men employed. They ask from the village a free site, free power, free light and exemption from taxes. To supply the electricity the town would have to construct and operate a power plant. To develop water power the consent of the Dominion Government is necessary, as Cornwall Canal is a Government work. The Government has signified its willingness to permit the canal bank to be tapped at a specified point by the municipality, which may develop 1100 horse-power, and pay the Government for the same \$2 per horse-power. The Government is said to be willing also to build the cofferdam, put in the wheels, enlarge the head weir, &c., and charge the cost (about \$30,000) to the municipality. It is estimated that \$38,750 more will have to be expended by the village to install an electric plant. It remains to be seen whether the ratepayers will agree to put so much into the enterprise.

Attacking the Hardware Manufacturers.

Certain parties in the hardware trade are moving for a public inquiry into the nature of the Hardware Manufacturers' Association. They maintain that it is a combination for the enhancement of prices and as such is liable to the penalty prescribed by the Customs act. A. A. Wilson, head of the Wilson Hardware Company, Montreal, is conspicuous in this movement. He says that there are 60 or 80 dealers in the Montreal district alone who are preparing to petition the Government for an investigation into the understanding on which the association members operate. The *Montreal Herald* thus quotes Mr. Wilson:

Satisfied that the protection afforded them by the Government has effectively shut out foreign competition, the Canadian hardware manufacturers have formed a combine to keep their goods at a certain price on the market, and if a manufacturer tries to remain independent they simply crush him out of business.

I may say it would not be so bad if they were satisfied to take a fair profit on the goods they manufacture. This combine goes a great deal farther. Besides keeping their goods at a certain figure they have agreed that if a wholesaler buys a certain quantity of goods every year from them, in addition to quoting the regular wholesale figure, they allow these larger men a special rebate which gives them an opportunity of underselling less fortunate firms who are unable through lack of capital or the extent of their business to buy as largely as the more wealthy firm of wholesalers.

The matter is the subject of a special meeting of the *Chambre de Commerce*, Montreal, this afternoon.

In Canada legal recourse against combinations in restraint of trade is, as has already been mentioned, afforded by a section of the Customs act, a section inserted in 1897. This is as follows:

1. Whenever the Governor in Council has reason to believe that with regard to any article of commerce there exists any trust, combination, association or agreement of any kind among manufacturers of such article or dealers therein to unduly enhance the price of such article or in any other way to unduly promote the advantage of the manufacturers or dealers at the expense of the consumers, the Governor in Council may commission or empower any judge of the Supreme Court or Exchequer Court of Canada, or of any superior court in any province of Canada, to inquire in a summary way into and report to the Governor in Council whether such trust, combination or agreement exists.

2. The judge may compel the attendance of witnesses and examine them under oath and require the production of books and papers, and shall have such other necessary powers as are conferred upon him by the Governor in Council for the purposes of such inquiry.

3. If the judge reports that such trust, combination, association or agreement exists, and if it appears to the Governor in Council that such disadvantage to consumers is facilitated by the duties of customs imposed on a like article when imported, then the Governor in Council shall place such article on the free list, or so reduce the duty on it as to give to the public the benefit of reasonable competition in such article.

The anti-combine section, as it is called, has not often been invoked and seldom applied. Three or four years ago the Canadian Press Association set its machinery in motion against the Paper Manufacturers' Association. The outcome of the judicial inquiry ordered by the Government in that case was a finding to the effect that there was an illegal combination among the paper makers. Acting on this report the Government reduced the duty on news print of a specified maximum low price from 25 to 15 per cent. ad valorem. Similarly the provisions of the law were successfully resorted to to break the autocratic power of the Tobacco Trust in Canada. Until the law was enforced that combination dictated the

price at which its goods should be sold and supplied its tobacco solely to dealers on its list. At the present time operations are being begun against the Wholesale Grocers' Guild by merchants to whom the guild members refuse to sell. It remains to be seen what the outcome will be in this case as well as in the case against the Hardware Manufacturers' Association.

Undoubtedly the position of the Canadian manufacturers of hardware has been strengthened by recent changes in trade policy. Their raw material has not been made dearer in many cases, for where the anti-dumping amendment cuts off imports at bargain prices the bounties enable home producers of material to lay it down at lower prices. Take the case of wire rods: They are, it is true, left on the free list, but they are the single article on the free list that is subject to the anti-dumping duty. If wire rods are sent into Canada at a price below that current in the country of production the difference in price is to be imposed as a duty, though that duty is not to exceed 15 per cent. ad valorem. But domestic rods have a bounty in their favor of \$6 a ton. Hence, though the hardware manufacturer caught no more sacrifice sale rods from the United States, he can probably get as cheap rods as formerly by buying in Canada, where production is assisted by a bounty. On other finished hardware articles the Canadian manufacturers have received substantial additions to their protection from the anti-dumping clause.

Notes.

The Canada Nail & Wire Company has been organized in Sydney, N. S., with an authorized capital of \$200,000. The chief men connected with it are John E. Burchell, Jas. T. Burchell, E. L. Willis, E. E. Mosley, Thomas Rutledge, Edwin E. Shaw, Thomas P. Mason and William Calvert. The works are to be established in Sydney. Raw material is to be obtained from the Dominion Iron & Steel Company.

Lewis Brothers, Limited, is the name of a company that has been incorporated with \$1,000,000 capital to take over the hardware business now carried on in Montreal by Lewis Brothers & Co.

There was an explosion at the works of the Dominion Iron & Steel Company on Thursday night. In consequence of it No. 4 blast furnace will be out of condition for operation some days. Nobody was hurt. As a result of a cave-in the following day three men were buried under a mass of iron ore at the works. They were eventually rescued uninjured.

The unprecedented storm in Nova Scotia almost forced a shutdown at Sydney this week. Had traffic been suspended a few days longer on the Intercolonial Railway the works of the Dominion Iron & Steel Company would have found it difficult, if not impossible, to keep going. Nearly 60 cars of pig iron, steel billets and wire rods were accumulated in the company's assembly yards waiting to be accepted by the Intercolonial for transportation to western points. But the railroad authorities refused to accept any more loaded cars at Sydney until it should be found possible to move those already stalled in its yards and at various sidings. Further, the railroad company could furnish no more empty cars to the steel people.

The City Council of Montreal recently visited the Angus locomotive and car works of the Canadian Pacific Railway Company. The Mayor and Aldermen were greatly impressed with the new plant.

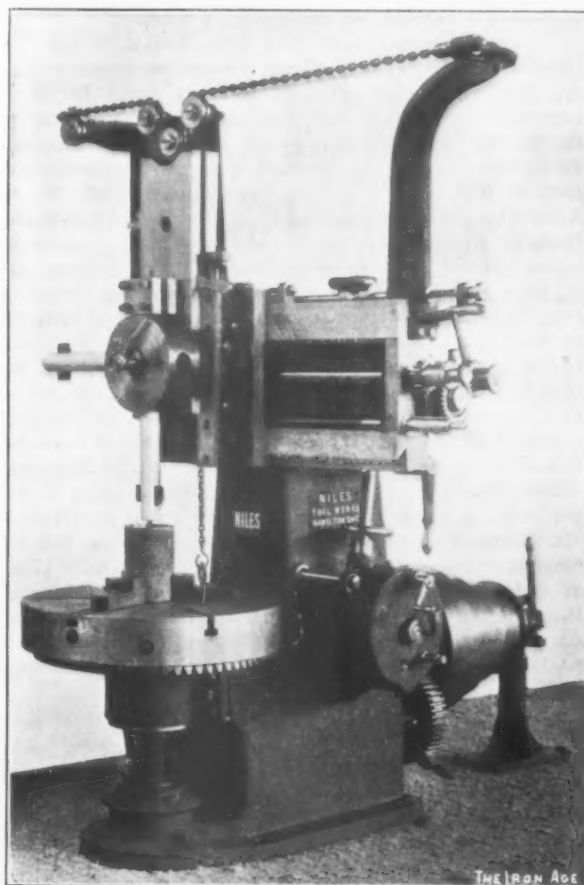
C. A. C. J.

The first electric railway was started in the city of Hongkong last August. The total length of single track is 14 miles, which is laid over a route measuring 9¼ miles. The rails weigh 86 pounds per yard, and are bonded with copper bonds of 6-0 size. The feeder cables are laid underground. The generating units are direct connected to engines of 50 horse-power each, and are two in number. The line pressure is 550 volts. The rolling stock of this pioneer electric railway consists of 26 single deck cars of the usual closed type and 16 open cars with the seats running across from side to side. All of the cars are mounted on Brill trucks.

A New Niles Turret Boring and Turning Mill.

The accompanying half-tone illustrates a 30-inch vertical turret boring and turning mill designed by the Niles-Bement-Pond Company, New York. It is particularly intended to use high duty steels and has many points of convenience in rapid production, such as automatic feed stops, quick change positive gear feeds and easily manipulated back gearing.

The table will swing work up to 31 inches in diameter or 15 inches high, that being the distance from the under side of the cross rail to the table. The machine has 16 speeds, ranging from 4.6 to 130 revolutions per minute. The feeds are changed by turning a small crank at the top of the circular casing of the feed box. The head is counterweighted in such a manner as to offer no interference with the swiveling of the turret slide. The gearing is of steel, and all parts of the machine have a



The Niles 30-Inch Vertical Turret Boring and Turning Mill.

strength and power sufficient for the largest cuts in tough cast steel. The numerous speeds and feeds provided enable the removing of stock at the most economical rate, and many of the minor details in design contribute to ease and rapidity in the manipulating of the machine.

A recent job performed on this machine illustrates its remarkable capacity. Fifty brass bushings 8¼ inches long and 4½ inches in internal diameter were bored with a roughing and finishing cut in 5¼ hours, the machine running at a cutting speed of 155 feet per minute. This means an average of 6½ minutes to each piece, which is but a small fraction of the time which would be required to do the same work in an ordinary lathe. The greater convenience with which work may be chucked on the horizontal table of a mill as compared with chucking it in the vertical face plate of a lathe is one reason for the amount of time saved. The general handiness of the mill, however, is more deserving of credit for the possibility of such a high rate of production.

The British Motor Car Industry.

BY S. G. HOBSON.

LONDON, February 25, 1905.—The great motor car exposition held a fortnight ago in Olympia affords a suitable opportunity to measure up the extent of the British motor car industry. The distinctively British motor car industry dates from May, 1896, when the Daimler Company was founded. That year was important for another reason. In November the red flag ordinance was abolished by the passing of the Locomotives on Highways act. The four succeeding years witnessed a financial indigestion. Good money was thrown away on immature organization, on inexperience, on blunders, on ignorance. At this period the popular conception (British) of a motor car was a glorified cycle, and it is not going too far to assert that the factory manager was obsessed with the same notion. A new era, however, dawned upon the industry in 1900, when the Automobile Club organized and successfully carried out the 1000-mile tour.

Apart from the fact that this 1000-mile run impressed the general public with a sense of the impending organization of the industry, it drove home the more important lesson that the cycle maker must give way to the trained engineer in the development of the motor car. When such firms as the Wolseley Company (a constituent part of the Vickers-Maxim combination), Sir W. G. Armstrong, Whitworth & Co., Willans & Robinson, and Crossley Brothers are making motor cars, it at once becomes evident that the trained engineer is in command.

Five years have not yet elapsed since the 1000-mile run. During this time it would be difficult to estimate to what proportions the industry has grown. Two estimates have been made, both admittedly incomplete, the first in February, 1904, by T. C. Aveling, and the second only a month or two ago, by Henry Sturmev. Mr. Aveling makes a comparison of the value of cars per week between the output of six firms in 1900-1901 and 1903-1904, which shows an advance from £3850 to £19,500, or 400 per cent., in three years—surely very rapid progression. Mr. Sturmev's estimate is more comprehensive, but not dissimilar in result. Instead of six firms he takes 17, all of which were in existence three years ago. Taking as the unit the trade done in 1901, relative index numbers for the pleasure car trade only show the following comparison: 1901-1902, 1700; 1902-1903, 3163; 1903-1904, 5544.

As compared with the French trade, if we consider output only, the British advance shows a higher percentage than the French. The business done by the French automobile manufacturers is, approximately: 1901, £1,200,000; 1902, £2,400,000; 1903, £4,400,000.

It will be recognized that the pleasure car had to precede the industrial car. The former may be cited as a distinct triumph for the amateur. Nobody but an amateur would have attempted to put 10 horse-power through a spur wheel and pinion only $\frac{5}{8}$ inch wide, and with a pitch of about 5-16 inch. But he was not to be denied, and soon found that the life of the gear was a short one. The engineer of the old school would have, of course, increased the dimensions, but the amateur in his lordly way called for better material. "What!" cried the engineer in scorn. "Would you cut spur gears out of nickel steel or tool steel?" "Go ahead and do it" said the amateur. The engineer set to work to do it, and in doing it naturally devised methods which would bring about the result at a reasonable cost and in the ordinary way of business. The amateur did not stop even here. The teeth of the wheels must be hardened and ground, and even polished. The result has, of course, been that many articles deemed at one time to be impossible by the engineer can now be bought at a tenth of the cost price of less than ten years ago. In this way the whole motor car industry has developed in many diverse directions.

Notwithstanding several legal limitations and irritations, well informed observers do not hesitate to assert that the industrial motor car trade will in the near future grow far beyond the pleasure car trade. Take one striking fact: There are at the present moment no less than 1500 motor omnibuses on order for delivery within nine

months. This shows in what direction the wind is blowing, but there remain a good many obstacles to be overcome. There is the initial outlay. A 5-ton motor vehicle will probably cost £650 and a 2-ton car £500. These are heavy amounts in themselves, but the upkeep is still far too costly. A good deal depends upon the ultimate solution of the tire problem. None the less an encouraging start has been made. The following firms are already making industrial motor cars with success: The Milnes-Daimler Company of London, the Stirling Company of Edinburgh, Thornycroft's of Chiswick, the Straker Steam Vehicle Company, the Lancashire Motor Wagon Company of Leyland, Coulthard & Co. of Preston, the Hercules Company of Levenshulme, the Yorkshire Steam Wagon Company of Hunslet and Clarksons & Co. of Chelmsford.

One of the most important uses to which the industrial motor car of the future will be put will be the transportation of agricultural goods. The problem is to collect the produce at the farmstead and, without constant handling, to bring it to the door of the consumer. In a certain country district the farmers are considering the possibility of co-operatively purchasing motor cars for quick delivery to retail customers, but they have not yet found a suitable car. It should not exceed 2 tons in weight and should travel 50 or 60 miles in three or four hours. For the carriage of goods in towns, delivery vans, &c., there are makers who can meet any reasonable demand. The increase in the number of motor vans, particularly those owned by the large delivery companies, proves this. The private shopkeeper, grocer, draper, milkman, &c., must wait a little longer before he can remuneratively employ the motor car. It may be one or two more years, but the end is absolutely certain.

On export account, particularly for colonial use, the industrial car may almost be said to be booming. An instance of this came to the writer's personal knowledge during a recent visit to the Wolseley Tool & Motor Car Company of Birmingham. The morning's mail had brought inquiries for petrol driven motor rail coaches for South America, Canada and Cape Colony, and a request from a resident commissioner in northwest India for the price of a suitable motor fire engine and snow plow for his district. In the works heavy motor larries were being built for use in Australia, South Africa, South America and Canada. Another department was busily engaged in building a 5-ton larry for the War Office, with a 40-horse-power engine, running entirely on paraffin.

The British motor car maker is a little too apt to assert that if only the British investor would intrust him with a little more capital all would be well. It is possible that in the later phases of development the industry has been hampered by want of capital, but capital will be forthcoming when we pass from the stage of the pleasure car to the more permanent and more remunerative industrial car. A pleasure car is subject to the whims of fashion, and is in no way a sure guide to the future. The fluctuations in the trade done by various motor car manufacturers demonstrate this. But the moment industrial motor cars become practical and economical we may rest assured that the British investor will be equal to the occasion. At all events, the rise of the British motor car industry during the past five years is one of the most striking events in modern commercial history. There are as yet a good many loose ends to be drawn in, and more effective combined action on the part of the makers is desirable, but the growth, such as it is, reflects the greatest credit upon British makers.

Pittsburgh coal operators have been advised that no concessions in freight rates for coal shipments for the Lake trade will be made this year. At a meeting of the freight traffic managers of all the lines in the coal traffic, recently held at Pittsburgh, the rates for last year were reaffirmed for another year, effective from April 1. The coal operators asked for a reduction, to meet competition of the Illinois operators in the Northwest and for an equalization of eastern Ohio and West Virginia districts, but this was refused. The rate on coal from Pittsburgh to Cleveland is 83 cents per ton.

A Heavy Jeffrey Apron Conveyor.

The accompanying illustrations are views of details in a system of heavy apron conveyors installed at the plant of the Lamb Wire Fence Company, Adrian, Mich., by the Jeffrey Mfg. Company, Columbus, Ohio. The



Jeffrey Apron Conveyor in the Lamb Wire Fence Company.

longest of these conveyors is 500 feet between centers and handles bundles of wire from the car to the storage. With nine men to attend it, the conveyor has unloaded 60 tons of wire, carried it 400 feet and piled it up in 30 minutes, this 60 tons being made up of bundles of wire varying in weight from 80 to 150 pounds, and this was less than the maximum capacity of the conveyor. It is claimed that this conveyor saves at least 75 per cent. of the labor that would be required to perform the same



Inclined Stretch of the Jeffrey Conveyor.

work entirely by hand. The conveyors are constructed of two strands of heavy steel thimble roller chain of long pitch, to which wooden flights or boards are bolted, forming an endless apron or belt. Owing to the favorable construction the friction, wear and amount of power required have been reduced to a minimum.

Nelson Robinson of New York. Henry J. Pierce of Buffalo and Thomas E. Mitten of Chicago represent interests that have obtained control of the International Railway Company, the big corporation that controls the electric lines of Buffalo, Niagara Falls and Lockport, together with the Buffalo & Niagara Falls line, the Buffalo & Lockport line, the Lockport & Olcott line, the Kenmore line, the Buffalo, Bellevue & Lancaster line and the Niagara Falls Park & River Railway, this latter being the scenic line on the Canadian side at Niagara. Other properties included in the company's possessions are the upper steel arch bridge at Niagara Falls and the suspension bridge across the river near Lewiston, the bridges both being links in the Niagara belt line. It is understood that W. Caryl Ely will resign as president and that Henry J. Pierce will become the head of the company. Changes agreeable to the new management are expected to be made in the directorate at a meeting to be held March 2. Mr. Pierce, who is to be made president of this great electric railway combination, was born in Bath, Maine, and is 48 years old. He moved to Buffalo at the age of 17 years. In 1880 he became interested in the Wood Products Company, refiner of wood alcohol. He is president of the Netherlands Tramway Company of Holland, which was organized about two years ago to con-

struct and operate an electric line between the ancient city of Haarlem and Amsterdam, a distance of 12 miles.

An English Electric Chain Hoist.

A recent issue of *Engineering* (London) contains the following description of an electric chain hoist of neat construction made by Lacy-Hulbert & Co., Limited, Boreas Works, Bettington, Surrey, England.

The combination of an electric motor with a set of chain blocks forms a hoisting tackle very suitable for many purposes, being more rapid and powerful than hand operated blocks, and less cumbersome than a crane. Such a combination is illustrated herewith, showing a set of 1-ton blocks driven by a motor. A small pinion on the motor shaft gears with a spur wheel, on the shaft of which is a hardened and ground steel worm cut from the solid. This worm meshes with a phosphor bronze worm wheel keyed to the shaft carrying the main chain pulley. The motor is series wound and is operated by two hanging cords connected to the starting switches, shown in the figure, one for hoisting and one for lower-



The Lacy-Hulbert Electric Chain Block.

ing. On releasing the cords the switches return to the off position and a friction brake comes into action to stop the load at the exact point and prevent any chance of overhauling. In consequence of the well-known characteristics of the series motor, the torque is greatest at starting, and the speed varies inversely as the load, so that light loads are lifted more rapidly than heavier ones. The hoisting speed of a 1-ton set of blocks at full load is 8 feet per minute. A very useful application of such blocks is in erecting shops and warehouses, as an addition to a hand operated overhead traveling crane. The blocks are suspended from the trolley and the same traveling arrangement utilized as before. Current may be taken to the motor by flexible cables, sliding contacts or any of the usual methods. The blocks are made in six sizes, from 1 to 12 tons, with a standard lift of 13 feet. All parts are interchangeable for each size.

Congress Orders Armor Plate Inquiry.

WASHINGTON, D. C., March 7, 1905.—The annual naval appropriation bill was passed by Congress on the eve of adjournment after a protracted debate in both houses over the items involving the authorization of two new battle ships and an appropriation of \$18,000,000 for armor and armament. As passed, the bill carries a provision requiring the Secretary of the Navy to make a thorough investigation as to the cost of armor plate and of the construction of a Government plant for the production of armor.

Two Battle Ships Authorized.

The contest over the authorization of two new battle ships was very spirited, a large contingent in both houses opposing the building of any more ships of this type in view of the lessons of the Russo-Japanese War. The two vessels were finally provided for with a displacement of 16,000 tons each, to have the highest practicable speed and great radius of action, and to cost, exclusive of armor and armament, not exceeding \$4,400,000 each. The conditions under which these vessels are to be built by contractors or in the Government navy yards are set forth as follows:

And the contract for the construction of said vessels shall be awarded by the Secretary of the Navy to the lowest best responsible bidder, having in view the best results and most expeditious delivery; and in the construction of all of said vessels the provisions of the act of August 3, 1896, entitled "An act to increase the naval establishment," as to materials for said vessels, their engines, boilers and machinery, the contracts under which they are built, the notice of any proposals for the same, the plans, drawings, specifications therefor, and the method of executing said contracts shall be observed and followed, and, subject to the provisions of this act, all said vessels shall be built in compliance with the terms of said act, and in all their parts shall be of domestic manufacture; and the steel material shall be of domestic manufacture, and of the quality and characteristics best adapted to the various purposes for which it may be used, in accordance with specifications approved by the Secretary of the Navy; and not more than one of the vessels provided for in this act shall be built by one contracting party: Provided, that the Secretary of the Navy may build any or all of the vessels herein authorized in such navy yards as he may designate, and shall build any of the vessels herein authorized in such navy yards as he may designate, should it reasonably appear that the persons, firms or corporations, or the agents thereof, bidding for the construction of any of said vessels have entered into any combination, agreement or understanding the effect, object or purpose of which is to deprive the Government of fair, open and unrestricted competition in letting contracts for the construction of any of said vessels.

A provision was also incorporated in the bill increasing the limit of cost of the three scout cruisers authorized by the appropriation act of 1904 to \$1,900,000 each, exclusive of armament. These are the vessels which the Department had hoped to equip with turbine engines, but the difficulty of obtaining proper guarantees in view of the limit of cost fixed by last year's appropriation bill induced the Department to abandon the turbine plan and to ask Congress for an increase in the limit of cost. If any contractor desires to submit plans of his own involving the use of turbine engines on the basis of a total cost limit not exceeding \$1,900,000, they will be considered, and if found satisfactory will be given the preference over plans employing reciprocating engines.

The Armor Plate Inquiry.

When the section of the bill appropriating \$18,000,000 for armor and armament was reached in the Senate an amendment was adopted providing that "the Secretary of the Navy shall cause a thorough inquiry to be made as to the cost of armor plate and of an armor plant, the report of which shall be made to Congress." In considering this amendment the House devoted several hours to discussing the alleged armor plate combination and the desirability of the erection of a Government plant for the manufacture of all armor required by the navy. Representative Vandiver of Missouri took the lead in the attack upon the armor manufacturers. He first presented an amendment in the form of an addition to the paragraph requiring the Secretary of the Navy to investigate as to the cost of armor plate and of armor plant, as follows: "And provided, also, that in the purchase of the armament and armor appropriated for in this act all contracts shall be

let to the lowest responsible bidder; but no contract shall be let for armor plate at a price exceeding \$398 per ton."

Chairman Foss of the Naval Committee antagonized this amendment on the ground that it was not germane to the Senate amendment to which it was offered, and this contention was sustained by the chair. Mr. Vandiver then modified his motion so as to require that a Board of Inquiry consisting of the Judge Advocate General of the Navy, the Admiral of the Navy, two naval constructors and a machinist experienced in the manufacture of armor plate, should conduct the investigation directed by the Senate amendment, and that the board should also inquire as to whether "any persons, firms or corporations have entered into any combination, trust or agreement or understanding, the object or effect of which is, or has been, to deprive the Government of free and open competition," and, if so, to "lay the facts before the Attorney-General for such action as he may deem proper under the law."

Government Factory Urged.

This amendment the Speaker held to be in order, and was the subject of an hour's vigorous discussion, in which Messrs. Vandiver, Hughes of New Jersey and Rixey of Virginia attacked the Navy Department for failing to award the recent armor contracts to the Midvale Steel Company. Mr. Vandiver declared that the only way in which the Government could escape "the grasp of the trust" was by building a factory of its own, and he asserted that if this had been done at the time when the Navy Department investigated the subject in 1897 its cost would have been saved threefold. Chairman Foss denied the truth of this statement, and quoted the testimony of Admiral O'Neil, when chief of the Bureau of Ordnance, to the effect that even if the Government put \$4,000,000 into an armor plant it could not make plate as cheaply as it could buy it from a private contractor. Mr. Foss admitted that there was apparently a combination between certain of the armor plate contractors, but he said the United States Government still bought armor at least \$100 a ton cheaper than any foreign Government, and he added that the Midvale Steel Company would receive contracts for all the armor it could make after proving its ability to turn out good plate within the time required by its existing contract.

When the vote was finally taken on the Vandiver amendment it was lost, nays, 158; yeas, 140. The House thereupon adopted the Senate amendment requiring the Secretary of the Navy to make an investigation as to the cost of armor plate and of an armor plant, and in this form the bill was finally passed. The Secretary of the Navy is, therefore, at liberty to pay any price within his discretion for armor plate and no date is fixed for the filing of his report. It is understood, however, that the inquiry will begin as soon as possible, and the report will be sent to Congress soon after the regular meeting in December next.

W. L. C.

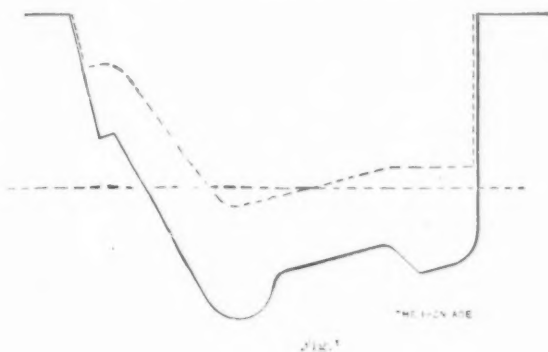
Quick Antiseptic Dressing for Wounds.—The International Bandage Company, 141 Kinzie street, Chicago, is placing on the market an antiseptic liquid which is claimed to have unusual curative virtue. Its value lies not only in its antiseptic properties but in the fact that it has the physical property of excluding air or moisture from the injured part. Absorbent cotton soaked with bandageen and applied to a wound or sore seals the injured parts air and water tight, and the dressing usually holds firmly for a week, taking the place of bandages, expensive iodoform or aseptic gauze. While it is used like collodion, it is stated to be superior to it as to durability, firmness and antiseptic protection. Bandageen, in drying, forms a solid capsule around and over the injured part, thus protecting it against jars and further injury, which might cause pain and delay in healing. Furthermore, there are no bandages to get caught on machinery, hooks or belts. It is spoken of as a medium between collodion and plaster of paris.

Rolls for Uneven Angles.—VII.

BY WILLIAM HIRST.

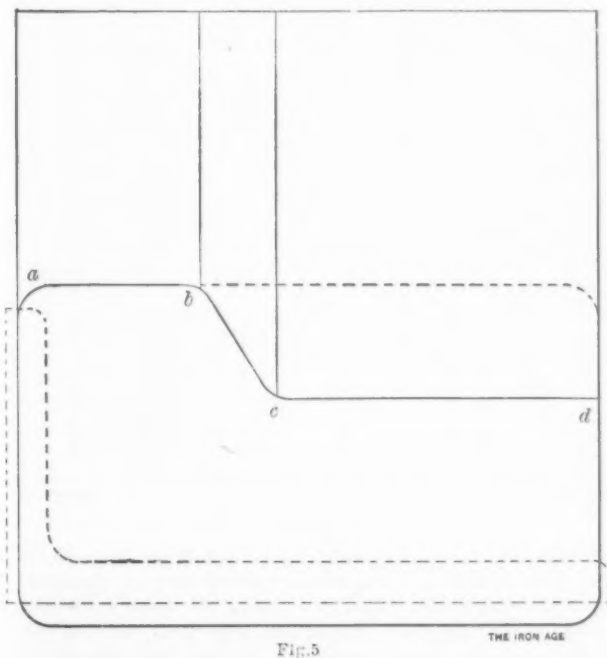
Sections Having a Short Heavy and a Lighter Tapering Member.

As shown in the previous part of this article, some sections may be opened so that the rolls may work out the details of the section with better effect and then to



be closed in the finishing pass. Others, owing to their form and stiffness, do not permit the use of this method; therefore such must be worked out as they are. In the case of Fig. 12 this expedient is not necessary, as the outline of the section requires a position that is at once most favorable to a proper distribution of draft. The section of Fig. 12 consists of a comparatively short heavy member and a lighter tapering one, the former having a flat angular edge and the latter a rounded one.

In accordance with the principle of keeping the same relation as to the areas of the two flanges, particularly in the last half of the series, we know that the greatest



draft must be on the heavy member. Although the disposition of the metal in Fig. 12 is in contradistinction to Fig. 13, the essential points to be considered in the design of these passes are the same—uniformity and accuracy in size and shape. With this section there is no objection to setting it in such a position that those parts which are required to fit may be inclosed within the groove. The edge of the heavy flange coming against the face of the collar on one side of the pass brings the position as in Fig. 1, which is coincidentally the position best adapted to work out the form of the section, which will be readily comprehended by the illustrations. As to whether it is advisable to set this section with the inside up or down, it seems that, as the pass is in such a position that little or no water or scale may be held, and

that the bar may be easier to handle with the heavy flange hanging down, that would be the correct way to set it.

To determine the number of passes in which to make a section, the draft should be added to the finished section for the pass next preceding, and so on until a pass is produced which will take a billet with the probability of filling it up reasonably close. If the rolls are strong and the power is ample an unusually heavy draft may be used—say, from 30 to 40 per cent; if not, a more moderate amount must suffice. In the distribution of the draft modification should be made at the points of the section where the rolls meet, so that the corner of the collar will be relieved.

In passes 1, 2 and 3, Figs. 26 and 27, the draft is sideways at the point *a*, and not down, so that there is no

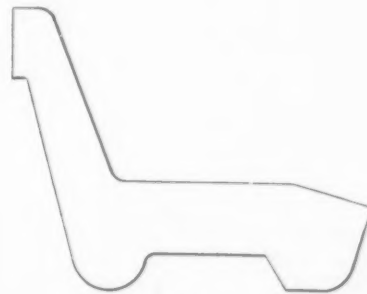


Fig. 14

probability of the metal being forced out of the pass. At *b* it is directly in line with the opening between the rolls. In passes 4, 5 and 6, Fig. 28, corner fillets are formed at *b* for this purpose. At *a* it will be noticed that there being only a single corner the opening must be therein at every pass of the series, and to regulate this corner passes 4 and 6 are opened on the side, after the manner of what are called open passes. Being opened on the side no draft can be applied sideways at or near the opening in these two or similarly formed openings, for the reason that a fin may be made by forcing the metal into the opening of the pass. To compensate therefor the preceding pass should be so proportioned that the section will be reduced slightly on the end of the flange.

This method is not favored by many designers, who see no harm in stretching the bar at these points. As shapes are usually made of steel, the effects of this may not be apparent; at least not in any way which would lessen the utility of the bar. It must be said that the method has the merit of saving wear on the collars and is particularly easy on collars whose edges are acute angles. Where the edges and corners of the bar are required to be full and true this method cannot be em-

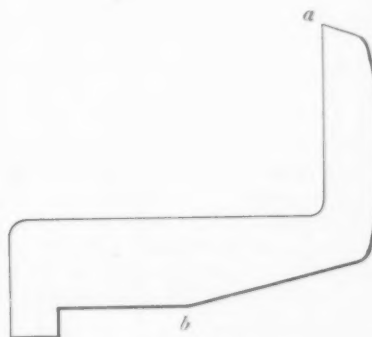


Fig. 15

ployed, and draft must be applied there as well as at other parts of the section; otherwise the corners will be drawn down, and if overdone the length of the flange itself falls short.

In the other passes—1, 2, 3, 5 and 7—draft in the same proportion as in other parts of the pass may be applied sideways, as in the direction of the arrow at *a*, in pass 3. In passes 1, 2 and 3, Fig. 26, the openings are all in the same direction, the side collars of pass 2 being reversed for that purpose. At *a* the draft is nearly all

sidewise, and as the corners of the billet are usually well rounded it is not likely that the metal will be forced out of the pass at this point in any of these three. At *b* the upper side of the section is increased in width so much that the collar overlaps the incoming section on that side in passes 2 and 3. This is accomplished by keeping the bottoms of each of the three exactly the same width, decreasing slightly if anything, and increasing the taper of the right side of the passes 2 and 3 considerably. As the succeeding passes are leaned further over to the left, this is not apparent at the first glance. Fig. 27 shows an arrangement of the collars to open pass 2 on the side.

As stated before, the draft should be distributed on the section proportionally throughout all its parts that each member may draw out equally. This principle

back again. In doing so the guides effect a material change in the section itself, for it must be clear that the convexed edge must upset or the other stretch. Sometimes it is one and again the other, depending upon the size, form or heat of the bar. Of the fact that it does take place there is no doubt. The effects of stretching are nearly always manifested by the corners and narrow projections from the main body of the section being drawn in, and as it may be important, if not the prime object, that these points should be kept up, it follows that there may be much misdirected effort worse than wasted.

In forging, by whatever method, it is generally accepted that the more deliberate action, as exemplified in the forging press, is less harmful to the physical structure of the metal acted upon than the sudden impact of the hammer, the underlying principle being that the slower

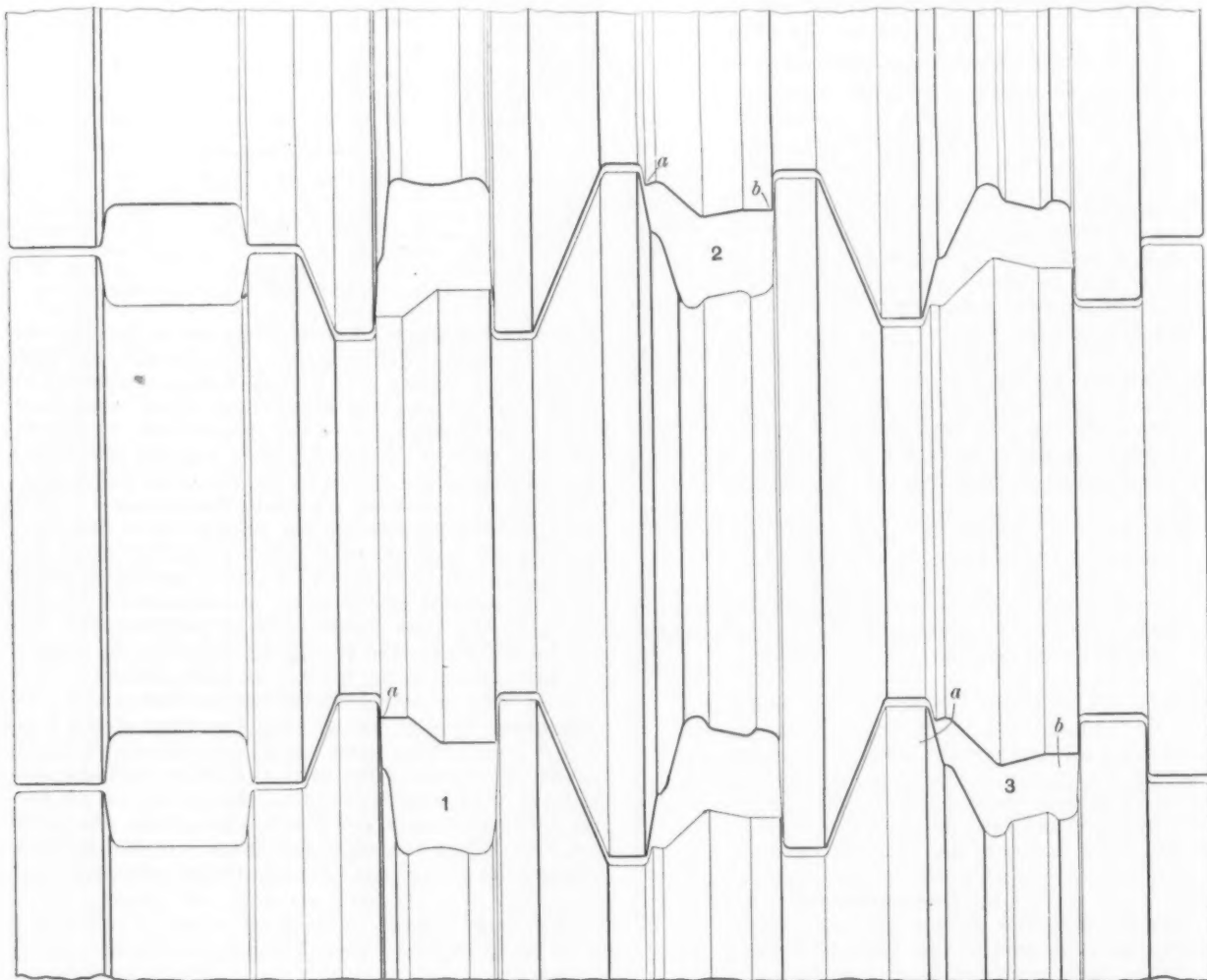


Fig. 27

THE IRON AGE

should be followed as closely as possible, more particularly in the last passes; but in the first to adhere thereto is manifestly impossible. In this event the pass should be modified and set in such a position that not only the body of metal may readjust itself, but that the action of the forming collar may aid the readjustment by forcing the displaced metal toward the greatest body or the part having the least draft.

If in the first passes the billet is subjected to heavy draft on one edge only, as illustrated in Fig. 5, it will be more or less difficult to keep the bar straight, as it is practically impossible to force all the displaced metal from one side to the other, and if left free it would bend away from the edge under reduction. It is common practice for all kinds of passes to keep the bar straight by the use of guides set up to form a continuation of the sides of the pass; in most instances more as a preventive or guard against possible accidents than for any particular need, but in this case they are an absolute necessity. When the bar is thrown against the guide it must be strong and firm enough in its fastenings to bend it

compression gives the particles of the mass time to readjust themselves, whereas the sudden force of the hammer blow separates them. In rolling the same principles hold good. The rolls themselves and their driving element may be strong enough to impose any amount of draft, and in a closed pass at one operation a billet may be literally crushed into almost any shape within reason. There are abundant indications of the deleterious effects of such practice on the physical qualities of the structure. Iron sections are easily torn apart in this way, and steel no doubt suffers to a certain extent in the same manner.

It is known that to get the best results from the highest grades of metal it is required that a bar be finished at a comparatively low temperature. Flow at low temperatures is almost nil; therefore heavy draft or radical changes in form cannot be accomplished without injury, imperceptible though it may be. On the other hand, we may get a bar hot enough to almost squirt it through the roll, but we do not improve its wearing qualities or increase its strength. While it may be advantageous to produce sections in the least possible number of passes,

for reasons of economy, from a productive point of view it does not enhance their value. In the first passes for easy flow, the opportunity should not be abused. If we could so apportion the draft that all parts of the section

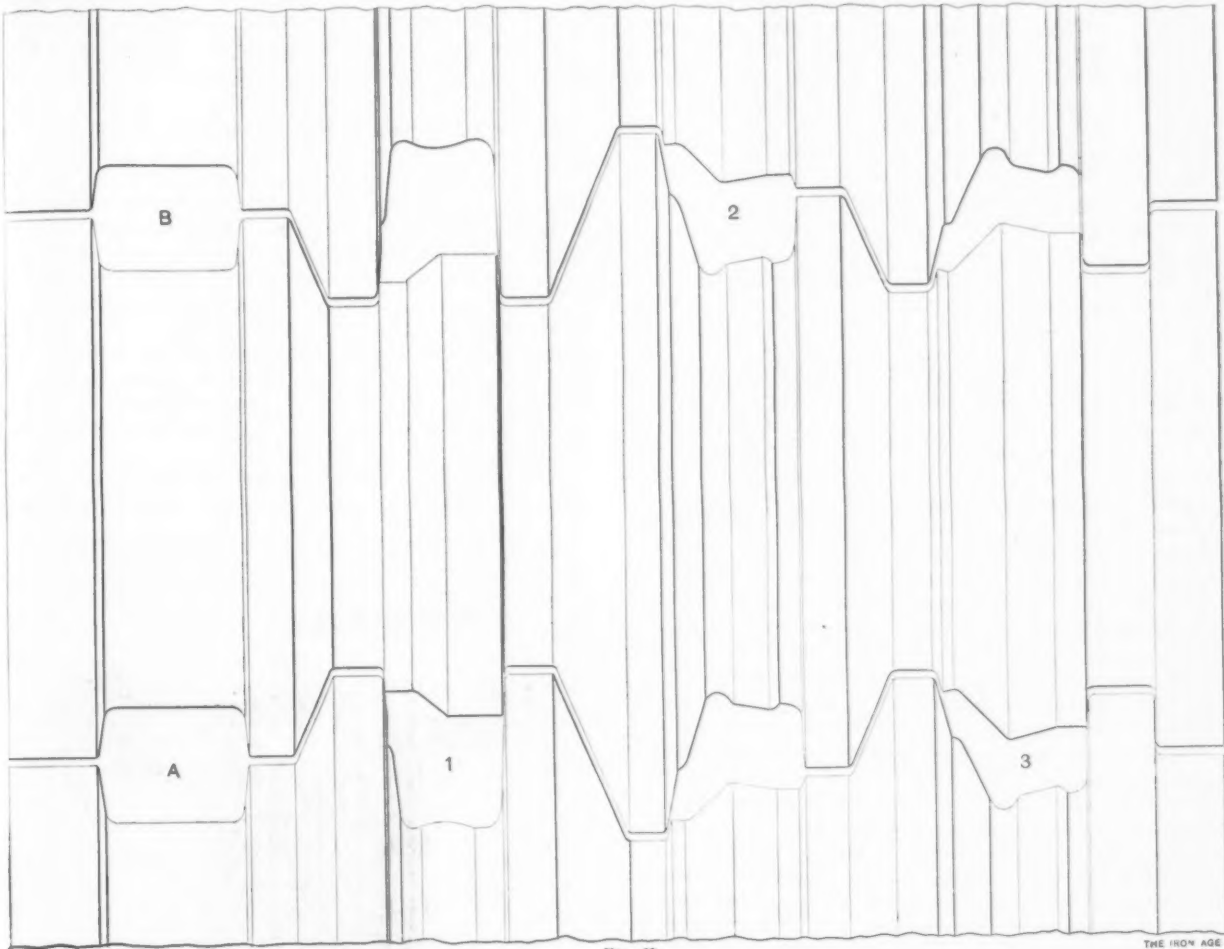


Fig. 27

THE IRON AGE

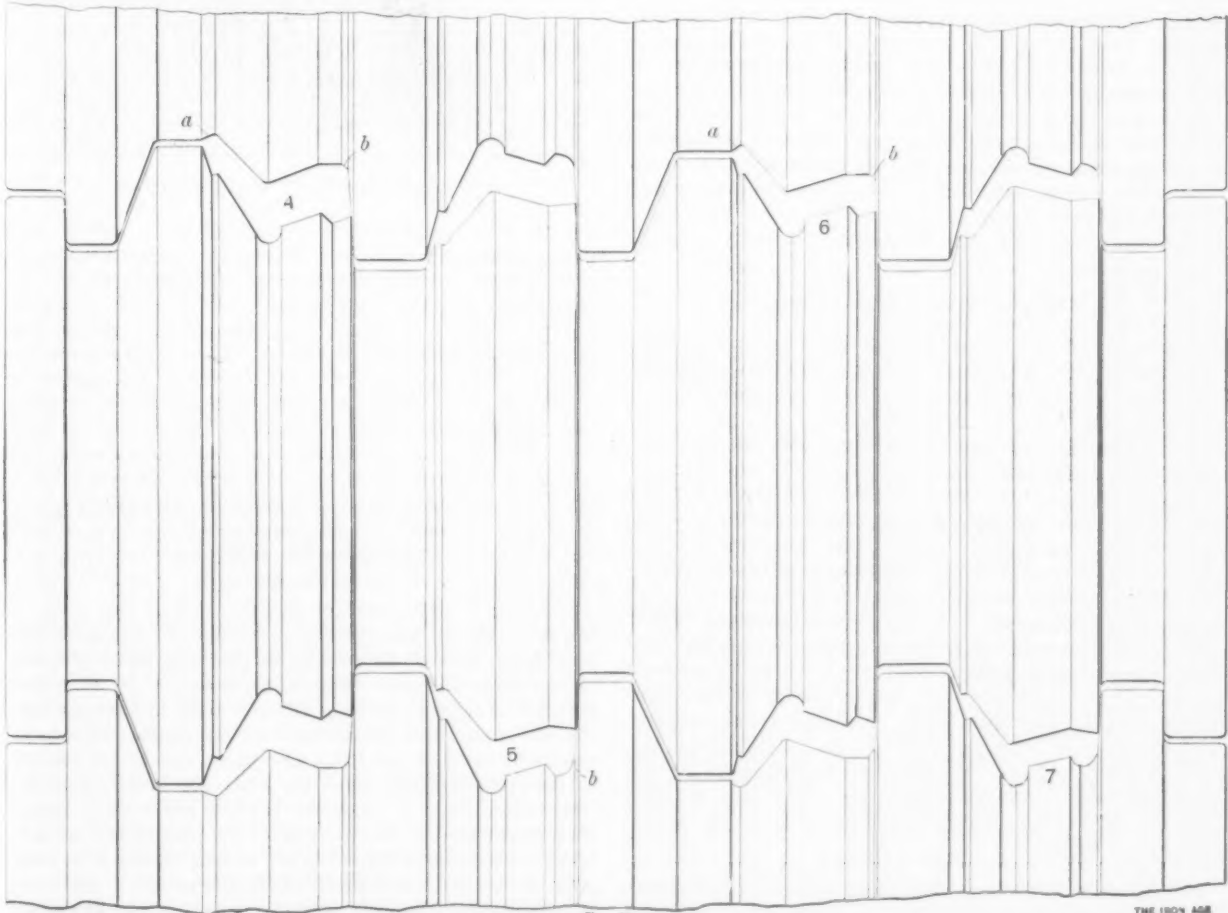


Fig. 28

THE IRON AGE

almost any section equal draft is impossible; therefore, while advantage should be taken of the comparatively would be reduced proportionally there would be no reason for moderation in this particular, but as it rarely happens

that a whole series of passes can be so laid out, a limit must be established somewhere.

In the production of any section economy demands that it be done in the least number of passes consistent with the proper treatment of the metal and the means for producing it. To this end the series of passes are laid out so as to use the smallest billet that the bar can be made from. In this section the height of length of the thin member forms the height of the pass, and if the section could be made without forcing or drawing down its edge the billet need not be larger than the height of the flange itself. We know, however, from the character of the pass that the edge of the flange will be drawn more or less. The distance that the flange will draw down or out, as it is sometimes termed, depends largely upon the amount of draft that is imposed in the preliminary passes.

For illustration, take Fig. 26. If the rolls were strong enough and the power sufficient we might succeed in forcing the billet into pass 3. On examination we would find that the flange had been drawn down so much that to finish the bar at its proper dimensions would be impossible. The same thing would happen in pass 2 except in less degree. In pass 1 it will be seen that the flange is more open, that its length from the body of the section is shorter and that the taper on the collar is so much that it would not engage half the edge of the billet at the first grip. These passes show what is meant by moderate draft; each one might be made to do more work, but the advantage would be problematical.

As in the case of the section in part 6, it may not be necessary to form the details of the outline of the section as complete in the earlier passes as shown, but it is a safe thing to do. It should be kept in mind, too, that these details should bear exactly the same position relative to each other in each succeeding pass.

This bar is one made in very large quantities, which warrants the use of every known expedient to assure economy. While these passes are shown in two sets of rolls, it is not to be inferred that this is thought to be their proper distribution. They are illustrated in this arrangement for the sake of compactness and to show the method of forming the collars to suit the conditions imposed. It is not within the scope of an article of this kind to attempt to show the various arrangements, as such depend almost altogether on the surrounding circumstances and the auxiliaries that are to be used. As these are found in almost endless variety, and are continually being improved, the purpose in this article is but to illustrate the principle upon which the passes are constructed and set in the rolls.

(To be continued.)

The Johnson Arch Plate.

As a means for facilitating the repairing and rebuilding of furnace door arches the Wellman-Seaver-Morgan Company, Cleveland, Ohio, is manufacturing what is known as the Johnson patent arch plate. The arch plate when in use is attached to the ram of a charging machine, and, the furnace door being raised out of the way, is held in the opening of the furnace while the repairs are made. One of the purposes which the arch plate serves is that of a shield against heat from the interior of the furnace, enabling the repairing to be done without shutting down the furnace and obviating the building of a temporary protecting wall, which is tedious and expensive, as it causes delays in the operation of the furnace. The main purpose of the arch plate, however, is to serve as a form on which the arch can be quickly relaid, as it supports it during construction. A flange on the forward end of the plate affords a stop for the bricks during the process of laying the arch. The arch plate is made of cast steel and is a permanent appliance, which can be utilized on short notice, with little or no delay in the operation of the furnace.

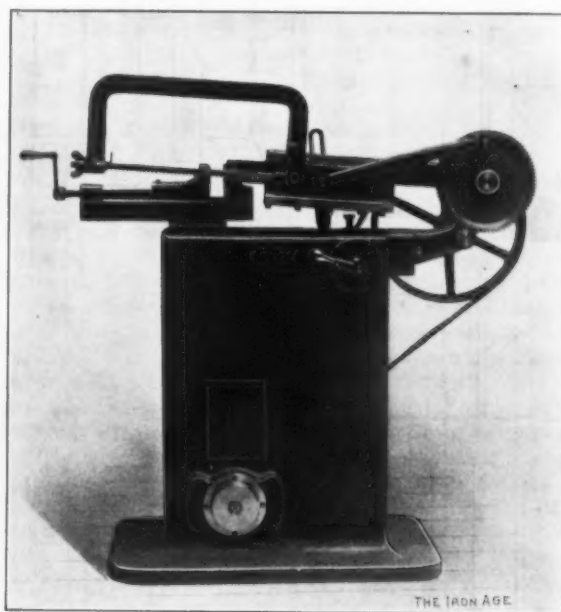
Drawback on Railroad and Boat Spikes.—The Treasury Department has decided that on the exportation of railroad and boat spikes manufactured by the Tredegar Company, Richmond, Va., from imported old iron rails

the legal drawback will be allowed. In liquidation allowance may be made of not more than 4 pounds as unrecoverable waste for every 100 pounds of material consumed, and for valuable waste in proportion to the values of such waste at the time of manufacture and the price paid at the works for the imported material.

The Willey Electrically Driven Shop Saw.

The motor driven tools manufactured by James Clark, Jr., & Co., Louisville, Ky., have been mentioned in these columns several times. The last description of examples of these tools appeared in the issue of February 9, at which time an index of all of the previous articles was given. It will be remembered that the line is distinguished by the fact that in nearly every case the motor is incorporated in the frame of the machine, its field frame being a part of the main frame casting of the machine. The desirable results obtained by this arrangement are a thorough protection of the motor and a lighter and more compact machine.

The illustration herewith shows an electrically driven shop saw. Other than being driven by a motor contained



The Willey Electrically Driven Shop Saw.

within its base and being controlled by a switch and starter similarly contained it does not differ very radically from the ordinary shop saw. The illustration tells nearly all there is to be said about it. The saw feeds by gravity, and has an automatic stop, which releases the switch when the work is cut off. It is designed for 12-inch saw blades, and will cut off stock $4\frac{1}{2}$ inches in diameter. The motor has self feeding carbon brushes, self oiling bearings with renewable bushings and an iron clad armature. As an option a graduated swiveling vise may be had instead of the plain vise illustrated. The machine weighs complete 310 pounds. The motor has a maximum capacity of 1-3 horse-power, and is wound for direct current of either 110 or 220 volts.

The very rapid increase in the value of the stock of the H. C. Frick Coke Company, Pittsburgh, was shown in an opinion filed by the courts in that city recently as to what constituted the income in the estate of H. W. Borntraeger, in order to make a division of the income between his two sons. Mr. Borntraeger at his death owned 1024 shares of stock of the Frick Company, and at the merger of the coke company with the Carnegie Steel Company, two years later, the trustee received \$327,000 of stocks and bonds of the steel company for the coke company stock. Six months later, on the merger of the steel company with the United States Steel Corporation, the court figures, the sum realized from the coke company stock, exclusive of dividends, was \$525,970.06, or \$481,558 in excess of the inventoried value.

Customs Decisions.

A decision of importance to importers of all classes was handed down February 25 by the United States Circuit Court of Appeals in New York in which it is held that a protest is insufficient, even if it claim the proper rate of duty, if the claim is made under a wrong paragraph of the tariff law. The suit was entitled the United States *vs.* Fleitmann & Co. A majority of the Board of General Appraisers had held that the protest was sufficient inasmuch as it claimed the right rate of duty, although under the wrong paragraph. General Appraiser De Vries dissented from this opinion, holding that to be entitled to relief an importer must specify in his protest the paragraph of the law under which he claims it. The position of the majority of the board was sustained by the Circuit Court, but Judge Wallace, who writes the decision of the Court of Appeals, reverses both the Board of Appraisers and the Circuit Court and holds that Mr. De Vries' view of the law was the correct one. The same issue has been tried twice before the Circuit Court of Appeals, once in Philadelphia and once in Chicago, and decided each way. It is likely that an attempt will be made now to get it before the Supreme Court. The board has before it a large number of protests involving the same question on all classes of merchandise.

Judge Wheeler in the United States Circuit Court of Appeals last week handed down a decision affirming the action of the Board of General Appraisers in overruling a protest by Albert Eckstein of New York against the classification as nonenumerated manufactures of metal, at 45 per cent., of nickel plated zinc sheets. The importer claimed that they were dutiable at 1½ cents a pound as zinc in blocks or pigs.

The Treasury Department has directed Collector Stranahan to take an appeal from the decision of the Board of General Appraisers handed down February 16 sustaining the contention of the Buehne Steel Wool Company that steel wool is dutiable at various specific rates according to value as steel in all forms and shapes not specially provided for. The contention of the Government is that it is dutiable at 45 per cent. as a non-enumerated manufacture of metal.

In a decision written by General Appraiser Fischer the Board of General Appraisers February 25 overruled a protest by Baer Brothers and others of New York against the classification as manufactures of metal at 45 per cent. of "flitters." Several alternative claims were made by the importers, all of which Mr. Fischer decides are without merit. The merchandise is described as follows:

Ingots of composition metal are put through rolls and further thinned down under a hammer until they become thin sheets. These thin sheets are cut into desired sizes, and from the shearings left over the merchandise in suit is produced. These shearings are first cut into small pieces with the scissors or a machine, and are then placed in a steel box in which a stamp goes up and down, still further reducing the size of the pieces, although not to the condition of powder. By such process, although scientifically it still remains a composition of copper as chief value with some other metal or metals, the merchandise is no longer available for the uses to which the composition metal of trade in thin sheets or leaves was put, but it has become adapted to other uses, being employed to sprinkle over the face of surfaces where it is desired to produce a glittering metallic effect. Moreover, it has its own distinctive trade name, being universally known as flitters.

Mr. Fischer is also the author of a decision handed down February 25 overruling a protest by the American Express Company against the assessment of 45 per cent. duty on round steel watch and clock wire under paragraph 137 of the tariff law, which provides specifically for such goods. The importer claimed that it was dutiable at either 4 7-10 cents a pound or ¼ cent a pound as steel bars.

The United States Circuit Court of Appeals March 2 handed down a decision affirming the Circuit Court and the Board of General Appraisers in the "ferro case," and finally settling the controversy in favor of the importers. The title of the case was the United States *vs.* the Roessler & Hasslacher Chemical Company, and the issue was the rate of duty to be levied on ferrochrome, ferrotungsten, ferromolybdenum and ferrovanadium, all of which are used extensively as hardeners in the manu-

facture of steel for armor plate, armor piercing projectiles, burglar proof safes, high speed tools, coal breakers, shoes for stamps, and other articles for which steel of more than the usual hardness is needed. They had been assessed as metals unwrought at 20 per cent. ad valorem, and the importers claimed that they were dutiable by similitude as ferromanganese at \$4 a ton. Counsel for the importers argued that the uses of these ferros were almost identical with that of ferromanganese, which is specifically provided for, and that, moreover, the ores could not be classed as metals unwrought because it was impossible to make from them alone any useful thing. The claim of the importers was sustained by the Board of General Appraisers and by the Circuit Court, but the Government refused to accept these decisions and carried the case to the Court of Appeals, which now affirms the two lower tribunals. This decision of the Court of Appeals will release a large number of protests from the suspended files of the Board of United States General Appraisers, and will compel the refunding by the Government of nearly \$100,000 paid in excess duties by the importers.

Judge Henderson M. Somerville of the Board of Appraisers writes a decision handed down March 2 which is of considerable interest to importers of all classes of goods. In it he sustains a protest by J. A. Barton, Buffalo, N. Y., against the assessment of duty on scrap steel reimported from Canada. The scrap was composed of cuttings and clippings from American hoop steel, as it was being worked up by Canadian manufacturers, and Judge Somerville rules that it could not be held that it had been in any way advanced in value while in Canada. As the Treasury regulations regarding proof of identity had been complied with he rules that the scrap is entitled to free entry as American goods returned.

The United States Circuit Court of Appeals handed down a decision March 6 sustaining the contention of the importers in the case of the United States *vs.* the Crucible Steel Company, in which the issue was whether or not the additional duty for polished steel should be imposed on cold rolled steel in strips which had been brightened by the pickling process incident to cold rolling. The merchandise had been assessed at various specific rates according to value, under the provision for steel in all forms and shapes not specially provided for. The collector assessed an additional duty of 2-10 cent a pound on the theory that it had been polished. This was based on the fact that in the process of rolling the steel is submitted to an acid bath, or pickling process, to remove the scale and smooth the surface, which leaves the steel white, and which the collector held was equivalent to polishing. The collector's view of the case was sustained by the Board of General Appraisers, but the board was reversed by the Circuit Court, and that tribunal is now affirmed by the Court of Appeals. They hold that the pickling process is a necessary part of the rolling process and that it cannot be considered as polishing for the purposes of the tariff law.

A submerged water main recently successfully placed across the harbor channel in Cork Harbor, Ireland, at a depth of 86 feet, has been regarded as a decidedly praiseworthy feat in submarine engineering. The main connects Queenstown with Haulbowline, and the work was of especial difficulty because of the great depth of the water, as well as the irregular nature of the bed of the harbor, which consists of jagged limestone rock. The submerged main measures about 2000 feet in length and consists of specially cast pipes having an internal diameter of 6 inches.

At a meeting of business men, capitalists and manufacturers, held in Youngstown, Ohio, on March 3, the Youngstown Chamber of Commerce, chartered under the laws of Ohio, was organized by the election of the following Board of Directors: Charles H. Booth, Arnold D. Thomas, A. E. Adams, J. H. Fitch, David Tod, M. I. Arms, Louis Heller, J. A. Campbell, Thomas McDonald, B. Hirschberg, Charles Hart, H. H. McElroy, George J. Renner, Jr. The objects are to secure new manufacturing plants for Youngstown and to look after industrial matters generally in that city.

THE IRON AGE

1855-1905.

New York, Thursday, March 9, 1905.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.

Our Trade with Canada.

Fiscal legislation does not always accomplish the purpose for which it is designed. One of the most striking illustrations of failures of this character is to be found in the workings of the Canadian tariff provision giving preference to British manufactured products. This legislation had a twofold object. One was to bind the mother country and the Dominion more closely together and the other was to check the growing domination of Canadian markets by the manufacturers of this country. Up to the 80's Great Britain had enjoyed the lion's share of Canada's purchases from manufacturers outside of her own borders. Year by year statistics of imports into Canada showed 50 per cent. or more of the total value of merchandise coming into that country purchased from Great Britain. But in the 80's a change came which developed very rapidly from that time. It was then that our manufacturing industries advanced with great strides. In the iron trade especially we began to overtake Great Britain, and in 1890 for the first time our output of pig iron surpassed that of the mother country.

During this period of rapid increase our trade with Canada grew so fast that in 1885 we supplied over 45 per cent. of Canada's total importations of merchandise against Great Britain's 40 per cent. The gap continued to widen in favor of this country and in 1897 we furnished 55 per cent. of Canada's imports to Great Britain's 26 per cent. In that year the first effort was made by the Canadian Government to divert trade toward Great Britain and an act was passed that after August 1, 1898, on all goods except alcoholic liquors and tobacco, the duties imposed on British goods should be 25 per cent. less than on goods imported from other countries. While this tariff preference in favor of Great Britain may have checked the growth of this country's Canadian trade, it does not appear in the statistical showing, as in 1900 the Canadians were purchasing over 60 per cent. of their imports in this country. In that year a stronger effort was made to favor Great Britain, whose preference was increased to 33 1-3 per cent. Despite this handicap we continued to furnish 59 per cent. or more of the Canadian imports in 1902 and 1903, while in 1904 our percentage reached 60, against Great Britain's 24 per cent.

The foregoing figures have dealt solely with percentages. If actual money values be taken the failure of the preferential tariff becomes still more striking, as Canadian imports have grown wonderfully in the past 20 years. Taking round numbers, in 1885 Canada's imports were \$103,000,000, of which this country furnished \$47,000,000 and Great Britain \$41,000,000. In 1897 the figures for the United States and Great Britain were, respectively, \$62,000,000 and \$29,000,000. In 1899 they were \$93,000,000 and \$37,000,000. In 1902 they were \$121,000,000 and \$49,000,000. In 1904 the United States is credited with \$151,000,000 and Great Britain with \$62,000,000. From 1885 to 1904 it will be seen that the Canadian imports from this country increased over 220 per cent., and from Great Britain only 51 per cent. Even

from 1899, when the preference of 33 1-3 per cent. in tariff duties began to be given to Great Britain, the United States increased its large Canadian trade 62 per cent., against a British increase of 67 per cent. on a very much smaller volume of business. It should be noted that the years for which the foregoing statistics are given are fiscal years ending June 30.

It would appear from the figures cited that any future falling off in our Canadian trade will not be largely due to the preferential in tariff duties given to Great Britain. The fact seems to be demonstrated that the Canadian market, so far as foreign supplies are concerned, can be better served by our manufacturers than by those of any other country. Not only is the distance from manufacturer to buyer shorter, but the tastes of the people are similar by reason of their proximity, and goods made in the United States are found to meet the requirements of our Canadian neighbors better than those brought across the Atlantic. The intermingling of the two peoples is constantly becoming greater, and no special dissimilarity in mode of living or in business methods generally is found on either side of the border. Such adverse change as may take place in our Canadian trade will be the result of the growth of Canadian manufactures. The preferential tariff has been shown to be practically harmless.

The Bessemer Railroad's Low Operating Cost.

The operation of the Bessemer Railroad, which has lately completed its eighth year as an adjunct to the Carnegie Steel Company, has fully justified the hopes entertained by Andrew Carnegie when he established this route for the carriage of iron ore from Lake Erie to his furnaces at Pittsburgh. The road has shown an extremely low percentage of operating cost to gross earnings, reduced last year to just a shade over 50 per cent., notwithstanding the low rate for which it carries ore. That its accounts are actually representative of ordinary railroad business, and not distorted by the fact that it is fundamentally a private line, is vouched for by the fact that the operations for some years have been by a company, the Bessemer & Lake Erie Railroad Company, which leases from the original company, the Pittsburgh, Bessemer & Lake Erie Railroad Company, and pays reasonable and satisfactory dividends to the stockholders of the original company.

The road has shown a low cost for hauling its freight from its early years. In 1901, when the total freight traffic was only 5,425,354 net tons, it showed an average cost per net ton per mile of only 1.87 mills. In 1904, with a total of 7,207,429 net tons of revenue freight, it showed a cost of 2.10 mills per net ton per mile. In that year were carried 4,087,675 gross tons, or 4,578,196 net tons of ore, out of a total of 4,988,271 net tons of southbound freight and a grand total of 7,207,429 net tons of revenue freight. This ore is carried on a 20-year contract providing for a rate of 3.5 mills per ton per mile, and this contract is carried out by a division of the regular rate with the Union Railroad, with which connection is made at North Bessemer, giving the Bessemer road the required portion. This means a rate of about 51 cents per ton for a haul of 146 miles. With this very low rate for the bulk of the traffic, and with the return haul largely empty, the percentage tonnage north being 25 per cent. in 1901, 23 per cent. in 1902, 30 per cent. in 1903 and 31 per cent. in 1904, the road has shown an operating cost of 49 per cent. in 1901, 57 per cent. in 1902, 56 per cent. in 1903 and 50.14 per cent. in 1904.

While the rates received on freight other than ore are

higher, they do not greatly increase the average, since this average, on all revenue freight, was only 4.37 mills per net ton per mile in 1904, and was only 3.90 mills in 1901. The low cost is obtained largely by very heavy train loads, with assistant engines where required, but the loads have not increased in the past four years. In 1901 the average train load south was 1496 net tons, gradually decreasing to 1437 net tons in 1904. The average, both north and south, has increased on account of the increase in return haul to 953 net tons in 1904.

James J. Hill, in giving testimony some time ago before a Congressional committee, made the statement that if he were allowed to build on scientific principles a railroad not required to carry passengers he could put out of business any waterway having a depth of less than 20 feet. This would point to a much lower cost than that of the Bessemer road, which nevertheless is the best known example of low cost of handling freight. It does little passenger business, and that which it does have is chiefly excursion business to its summer resort.

The Constant Efforts to Legalize Picketing.

Year after year the attempt is made by organized labor to procure the passage of so-called "peaceful picketing" legislation, aimed at the injunction, without which it has been time and time again demonstrated that manufacturing and other business cannot be conducted in time of labor disturbance. Thus far the attempt has failed, owing to the vigor of employers of labor in pointing out the actual meaning of innocent looking bills which, once enacted into law, would clothe the unlawful element of striking workmen with a power against which the only remedy would be the police, and it has been proved in a great many instances that little can be expected of these guardians of cities and towns because of their close affiliations with the labor element. Such a bill as that just reported adversely in Massachusetts is an excellent sample of this attempt. It provides that "in case of a strike or lockout or other dispute between an employer and employees it shall be lawful for the employees or other persons to walk upon the public streets and ways in the vicinity of the place of employment, or in any other place to which they have lawful access, and in a peaceful way to converse with persons intending to go to such employer for work, for the purpose of informing them of actual facts in order to induce them not to enter into or not to continue in said employer's service."

Nothing could sound less threatening in the mind of the inexperienced member of a Legislature. It breathes of good order and quiet. It brings up a picture of law-abiding men, the best class of workmen, stating the case of strike or lockout dispassionately and fairly, and, this accomplished, going about their business, to let the aspirant for work decide for himself what is best for him to do, and if he decides to apply for work, and gets it, to be let alone, without danger of violence or of being ostracized. This might be a true picture were the best classes of workmen chosen as pickets. But they are not chosen. Instead, the fire eating spirits are the pickets and their "peaceful way," to quote the bill, often contains most pronounced threats and epithets, of which "scab" is not the most menacing and obnoxious. Able lawyers say that such a law would rob the courts of the power to restrain trespass by injunction. In other words, it would take from owners and lessees of property the rights given them under the common law.

Thus far the attempt has failed. For several years the matter has been brought up in much the same form

as the bill here quoted and has met defeat. The danger lies in an assurance on the part of employers that a danger several times averted was really no danger at all. If strong opposition to any subsequent bill of this sort is not exerted it will sooner or later become a law, and once upon the statute books will not be easy to remove.

The \$25,000 National Banks.

Since the law went into effect in 1900 permitting the establishment of national banks with capital stock of \$25,000 a great many State banks have been converted into national banks, and a goodly number of new banks have been established in communities which could not support an institution of larger capital. This is true especially of the South and West. During five years the number of national banks has increased from about 3600 to some 5600, and of the new banks 1507 were chartered under the act of 1900 with \$25,000 capital stock, representing a banking capital of more than \$39,000,000. Great good has been accomplished by this law, as is generally conceded. There has been trouble in a few instances, due to inexperience, but the new institutions are strictly under the control of the national Government and whatever trouble has occurred will be remedied in good time. The cases are few. Business men having dealings with distant communities know the advantage of a national bank in making collections. The benefits to local business interests are obvious. Some of the State banks have proved satisfactory. On the other hand, others have not. They are always regarded with more or less suspicion, many of them being in the nature of private banks. The presence of a national bank increases the credit of the business interests of its neighborhood. An effort is now being made to amend the law so that a director in a \$25,000 bank need hold but \$500 of the stock instead of the usual \$1,000. The argument in favor of the exception seems a sound one. The \$1000 rule ties up a large share of the bank's stock in the directory, and this, coupled with stock picked up by nonresidents for investment purposes, leaves but little for distribution among the inhabitants of the bank's community, and it is always well that a bank's stock be well distributed among those having business with the institution. It would seem that whatever may be needed to assist in the extension of the national banking system into districts now unprovided with safe and modern banking facilities should be done, provided it does not in any way weaken the welfare of the bank's customers by weakening security.

The United States Supreme Court on February 27 handed down its decision in the famous rupee case, which in point of the amount of money involved and the interest excited is the most important litigation which has arisen under the present tariff law. The decision, contrary to all expectation, is against the importers, thus reversing all the lower tribunals which have passed on it. This is the case about which Secretary of the Treasury Shaw some months ago, when told that the courts had decided it seven times against the Government, replied, "seven times wrong." This decision of the Supreme Court relieves the Government of the necessity of paying about \$4,000,000 in refunds.

The third offer of preferred stock to its workmen by the United States Steel Corporation has resulted in the subscription for the full amount appropriated for the purpose, 25,000 shares. In this year's offer the subscription price was fixed at \$87.50. In 1904 the employees subscribed for 32,519 shares at \$55 per share. In 1903 the subscriptions were for 48,933 shares at \$82.50 per share.

CORRESPONDENCE.

Costs as an Element in Technical Education.

To the Editor: I note with interest the reference in your issue of March 2 to the provision in the Worcester Polytechnic Institute for giving students instruction in matters relating to costs and shop management. The implication, however, that this is an innovation is not quite in accord with the facts.

Some 15 years ago I urged upon the late General Walker, president of the Massachusetts Institute of Technology, the importance of incorporating in the engineering courses of the institute instruction in the fundamental principles of shop management and industrial accounting. After numerous discussions he was convinced of the expediency of doing this, and delegated the matter to Professor Schwamb, then an assistant to Professor Lanza. As a result Professor Schwamb collected a large amount of information concerning the practice of many of the most representative and best organized industrial establishments, and formulated this into a course of lectures. At first, attendance on these lectures was optional, but I understand from Professor Schwamb that it is now included in the requirements in certain courses and involves also considerable preparatory work by the students.

Some years later I succeeded also in interesting Professor Hutton, dean of the engineering department of Columbia University, in the subject, with the result that a similar course of lectures has for some years been given there and is regarded as an important feature in the engineering course.

I believe also that a beginning in the same direction has been made in the Towne Scientific School of the University of Pennsylvania, under Professor Spangler. It is probable that some work of similar character has been done in some of the other technical schools concerning which I am without information.

As I have for so many years been an advocate of the incorporation in technical courses of study in the field of industrial management and industrial accounting, I am glad to note any progress, however small, in this direction. The best opportunities for graduates of technical schools usually are found in connection with organized industries, and chiefly in positions which sooner or later involve administration. The technical school aims to qualify its students thoroughly in the theory of the technical side of their work, but heretofore has done little or nothing to qualify them for the related work of administration and management, with which they are almost certain to be concerned sooner or later and in which preparatory study of the underlying principles would be equally helpful. I predict that in time this fact will be generally recognized and that accordingly technical courses will be so organized as to include teaching in the principles of shop management, of industrial accounting and of administration.

HENRY R. TOWNE.

NEW YORK, March 6, 1905.

Modern Car Wheel Foundry Practice.

To the Editor: Noting in your January 5 issue of the current year an account of a plant for producing car wheels, which you characterize as "the most modern, systematic and continuous example of foundry practice in this country," I am led to criticize both it and your description of it, and to say that, far from being most modern, systematic and continuous, it does not approach such conditions as they are understood in the modern foundry producing large numbers of the same thing every day, in addition to which it violates a number of the accepted truths of manufacturing economics as they are understood to-day.

To enable this plant to be classed at all with modern foundries on this class of work, it should in the first place have its molding done upon continuous molding tables, supplied with sand from overhead hoppers, the finished molds then being conveyed to cupolas to be poured, thus saving time, labor and space and enabling the utilization

of labor to its best advantage at one operation all day long. Such continuous systems are in gradually increasing use in this country and produce a large increase in capacity, both for a given amount of floor space and a given number of operatives. Such a continuous system would provide as well for the separation of the various operations, instead of having them piled over one another as in this plant, and by the localizing of them each in a separate place, enable each to be handled in quantity and to best advantage.

The plant as described uses one molder and two helpers for the production of 25 molds per day, or a production of 8 1-3 molds per operative, while with a continuous molding table one molder with six or seven helpers would probably produce about double that number per operative, with a lower average wage rate and an economy in space and investment, since the number of patterns necessary would decrease proportionally to the increase in production.

Of course, such a system requires ordinary labor at various places for handling, &c., but my experience is that, even counting in such additional labor and including the necessary power house labor, the production per individual engaged is about 10 to 12 per cent. greater than when working as in the plant which you have described.

Continuing the comparison further, such a continuous system would enable at least one pair of cupolas, with a second pair as alternates, to pour the whole day's production, thus doing away with 50 per cent. of the charging labor and investment in melting equipment made necessary by the arrangement which you describe, and making a considerable decrease in the amount of space necessary for melting, as well as in equipment necessary for handling the coke and iron, and enabling this to be done in one place, instead of being scattered over three places.

Imagine, now, such a system in operation and the mold completed on such a continuous table as I have mentioned; it would then be transferred to a conveyor which would carry it to the cupolas, where it would be poured in transit. It would then proceed on this conveyor such a length of time as is necessary for it to cool sufficiently to bear handling, when it would be thrown off on a separating grid, where the flasks would be shaken out and thrown on a conveyor which would carry them back to the molding tables. The sand would fall on a conveyor which would carry it to riddling apparatus, where it would be cleaned of shot, sprues, rods, &c., and it would then while in transit be tempered and riddled sufficiently to thoroughly mix it, and then fall on a conveyor which would carry it back to the molding tables. Contrast this with the shaking out, riddling and tempering of the sand on the floor where it is to be used, at an enormous waste of room and labor, to say nothing of the inconvenience of working around molds and patterns and of tempering separate piles of sand, with the undoubted lack of uniformity which such work entails. Such a continuous system would, by the use of three men, handle all the sand for the whole production claimed for this foundry.

Going further, the shaken-out wheel would be taken up on a conveyor *en route* for the annealing ovens, and the surplus sand sticking to it knocked off over a trough in which runs a conveyor which would take this sand to unite it with the main body of sand. While still in transit, and over another trough, the core would be knocked out, a conveyor in this trough disposing suitably of the core sand, and at a convenient moment the sprue would be knocked off to fall on a conveyor carrying it back to the cupola.

This method provides for the immediate removal of the product from the scene of the last-performed operation without waiting upon or depending upon three other operatives, as in the plant which you illustrate, thus doing away with three chances of delay. It is unwise to assume that four men can all work at the same speed, in addition to which the plan of handling four pieces at a time presupposes perfection in the working of all of the operations and apparatus up to this point, which is a manifest impossibility.

The handling of a number of pieces at a time also re-

moves any possibility of increasing the efficiency of the labor employed, since the slowest gang sets the pace in each group of four, instead of the fastest individual setting the pace, as in the method which I describe.

The wheels would then pass to the annealing pits, into which they would be lowered, these pits being much closer together than those in the foundry that you describe, they not being dependent upon the spacing of the floors, and being, as well, all in one place, instead of two, a saving is gained in room and in the putting all of the annealing, and incidentally the cleaning, in one place, and hence each under the eye of one foreman.

In all probability, considerable space could be saved by making the inclosing building a two-story building, with the molding and casting in the second story and the cleaning, boring, mounting and grinding, if any, in the first story.

As a summary of the advantages of such a system as I am outlining—and it is a modern one, for there are a number of foundries operating directly on this system in this country—there are:

1. Continuous operation of the labor, skilled or otherwise, at one task for the whole day.
2. The putting of each operation in a distinct place by itself, and not mixing it up with other operations in any one place, thus leading to economy of space and increase of production.
3. The greater continuity of the work, due to the absence of the necessity of stopping one operation that another may be performed.
4. The locating of the annealing and cleaning each in one place, instead of being subdivided, as at present, with a consequent reduction in cost in handling equipment, greater efficiency of labor, and lessening of cost of superintendence.
5. A saving of about 50 per cent. in melting equipment, and of considerably more than 50 per cent. of space for melting.
6. The saving in labor, in handling, and tempering sand.
7. The saving in investment in patterns, due to the considerably greater capacity of continuous molding tables.
8. The saving in molding space, due to greater capacity of continuous molding tables over ordinary floors.
9. The saving in quantity of skilled labor, due to the greater capacity of continuous molding tables, with consequent reduction of average wage.
10. The greater efficiency of all labor, due to the continuity of the operations, this amounting to at least 10 or 12 per cent.
11. The saving in space in annealing, due to the lack of need of conforming the construction of the annealing ovens to any other part of the plant.
12. The ability to develop the efficiency of the individual skilled laborer by freeing him from the necessity of waiting upon his fellow operatives.
13. Considerable saving in the labor and space necessary for distributing cores.

G. K. HOOPER.

NEW YORK, March 3, 1905.

The Chicago Pneumatic Tool Company Secures the Philadelphia Company.—The Philadelphia Pneumatic Tool Company, through its president, Julius Keller, announces that it has assigned all its business, patents, trade-marks and good will to the Chicago Pneumatic Tool Company and is to join interests with the latter company. The decision on the part of Mr. Keller and his company is the termination of bitterly fought contests in the patent courts between the two companies. Mr. Keller has become a director in the Chicago Company and will have the direct management of the Philadelphia plant, which will be operated as before for the manufacture of Keller hammers, drills and other tools. It is understood that other officers of the Philadelphia Company, as well as the selling force, will be taken care of by the Chicago Company. The terms on which this transfer was effected are not divulged. Mr. Keller was made a director of the Chicago Company at its annual meeting February 21 and the final transfer of the property was effected March 1.

Lake Mining Matters.

DULUTH, MINN., March 4, 1905.—With present improvements completed, the Duluth, Missabe & Northern road will have 22 miles of double track on the main line as well as many long passing tracks. This is in addition to all double trackage on the north and south ends of the road. This company's additions to equipment for the present spring will include 1300 steel cars and 12 locomotives of the consolidation type, weighing 165,000 pounds on the drivers. The Duluth & Iron Range road is adding to its double track lines, and in a few weeks will have the entire line from its docks to the Fayal terminals double tracked aside from 3 or 4 miles where it has not been necessary. This company's equipment order includes 500 ore cars and nine consolidation type locomotives, weighing 170,000 pounds on the drivers. The Great Northern road has just let a contract for a short link in double trackage, which will give it a two-track line throughout, though the tracks are not for the entire distance close together. This road's equipment orders have not been completed, but include 350 ore cars and probably some motive power, though it is in shape to distribute equipment from the entire Great Northern road to any point, and thus requires less for any one division than do roads that have no such reserve lines to draw from. All the cars ordered are of the steel 100,000-pound hopper bottom type, that will carry a load 10 per cent. in excess of their capacity and actually are generally loaded to about 106,000 pounds.

It is reported that Champion mine, Beacon, Mich., which has been idle for two years, is to resume. Beacon had a population of about 3000 people while the mine was running, but since its closing has been almost depopulated. The mine is the second hard ore mine of the lake region and is now owned in fee by the United States Steel Corporation.

At Crystal Falls the Great Western is now stocking ore again after a long idleness, and the big pumping plant and water blowers are working satisfactorily. At the same company's Dunn mine preparations for handling the big flow of water expected from the open pit, as outlined a week ago, are still in progress. At Mansfield the new shaft house is in place, and in a short time it will be possible to begin bailing the water out of the mine, which now rises to within 250 feet of the surface. At Baltic in sinking the main shaft the work is going down as much as 17 feet a week in very hard rock and mining ore progresses rapidly. The same company will do little or nothing at the Caspian until spring. More development work is under way in the immediate vicinity of Crystal Falls than anywhere in the lake region, except at Mesaba points.

The Algoma Steel Company has made its purchases of ore for the coming season, and most of it is American, chiefly Mesaba, from which range the company is to get 75,000 tons of Holland, a new ore guaranteed to run 62 iron and 0.045 phosphorus. Holland is a lumpy soft ore, of coarse texture, and quite desirable. It is understood that it costs, laid down at the Sault, about 5 cents per unit. Some Negaunee ores and other Mesabas have been purchased, and the company will have a little Ontario ore, taking the trifling product of the Williams mine, at Loon Lake, north of the Sault, which is a rather lean siliceous Bessemer. At present this does not amount to more than 35 to 40 tons a day, but is expected by its owners to exceed this volume soon. The tonnage from the Helen mine, belonging to the Algoma Company, is to be used in part at its own works and in part shipped to eastern Ontario and the United States. The ore question as it affects this company has been a rather interesting one, especially as the company would get a larger bonus from the Canadian Government if its steel were made entirely from Ontario ores than if largely from American. This company has not looked with favor on the Atikokan magnetites, and is not liable to use them unless at concessions. But if these ores can be delivered as their owners say it is very probable they will be of especial value to Canadian works.

D. E. W.

OBITUARY.

EDWARD LONGSTRETH.

Edward Longstreth, one of the owners of the Baldwin Locomotive Works until 1886, died February 23 in Philadelphia, after a long illness. He was a native of Bucks County, Pa., and was born June 22, 1839. He was educated in the schools of the Society of Friends, and entered the Baldwin Works as an apprentice in 1857, undertaking a five years' study of machinery and engineering. He displayed such uncommon skill both as an apprentice workman and in the suggesting and devising of new appliances that before four years of his time elapsed he was made foreman of a department. He perfected the gauge system, long a feature of the work turned out at the plant. He was made general superintendent in 1867, and three years later was admitted to partnership, retaining full direction of the mechanical and construction departments. Although the youngest member of the famous firm at that time he held the position of greatest importance in the routine of the works. Overwork led to ill health and his eventual retirement. Some of his inventions were patented. He served for a time as vice-president of the Franklin Institute. He was a director of the Engineers' Club.

NOTES.

NATHAN C. LOMBARD, senior partner of the firm of N. C. Lombard & Co., Boston, Mass., mechanical engineers, died suddenly at his home at Cambridge, Mass., February 24. He was born at Biddeford, Maine, in 1827, and was educated at Foxcroft and Guilford academies. After teaching school for a year he opened an office as mechanical engineer and draftsman at Lowell, Mass. After five successful years he removed to Boston, where he practiced his profession for the remainder of his life. He leaves four children.

HENRY TOD, one of the best known iron manufacturers at Youngstown, Ohio, and a large capitalist, died in that city recently, aged 67 years. He leaves a widow and one son. He was born at Warren, Ohio, in 1838, and at the age of 21 years was manager of the blast furnaces of the Brier Hill Iron & Coal Company, at Youngstown. Later, he became prominently connected with a number of manufacturing concerns in the Mahoning Valley. He was vice-president of the Brier Hill Iron & Coal Company and allied interests, vice-president of the First National Bank, Youngstown, and director in the Mahoning National Bank, the Ohio Leather Company, the Youngstown Steel Company and the Youngstown Carriage & Wagon Company.

HENRY DOYLE, superintendent of the tube mill of the Youngstown Iron Sheet & Tube Company, at Youngstown, Ohio, died in that city recently. He was born in Wheeling, W. Va., and was 48 years of age.

J. WESLEY GEPHART, president of the Nittany Iron Company and the Bellefonte Furnace Company, Bellefonte, Pa., died February 14 of apoplexy. He was born at Millheim, Pa., May 25, 1853. He was a lawyer by profession.

L. VON TETMAJER, professor at the Technical University at Vienna, is dead, as the result of a stroke of apoplexy, while delivering a lecture. Professor Tetmajer was for many years connected with the Polytechnic at Zurich, Switzerland, and was one of the leading authorities in Europe on the strength of materials.

IRA BISHOP, at one time a prominent iron and steel manufacturer, committed suicide in Golden Gate Park, San Francisco, February 21. He went to that city from Montreal and made a large fortune, but speculation in recent years swept away his wealth.

EDWARD HARVEY MIDDLETON, a member of the family of that name that has been associated with the Pennsylvania iron and steel trade for a century or more, died February 22 at Frankford, Philadelphia, from paralysis, in his fifty-seventh year. He was the owner of the Frankford Machine Company until 1901, when he retired in favor of his sons. A widow and seven children survive him. He was a member of the Manufacturers' Club.

EDWARD LEWIS, long prominently identified with manufacturing interests in Cleveland, Ohio, died in that city

February 14, aged 86 years. He arrived in Cleveland in 1841 from his home in Malmsbury, Wiltshire, England, and engaged in the iron business with W. A. Otis on Merwin street. Mr. Otis realized the sterling qualities in Mr. Lewis and intrusted him with a small iron mill at New Castle, Pa. Here he prospered and became one of the partners in the firm of Ford & Otis, afterward the Otis Iron Company. About six years ago he disposed of his interests to W. C. Scofield, one of his partners, and retired from active life.

THOMAS FINDLAY, for many years at the head of the Findlay Machine Works, Oswego, N. Y., died February 17, aged 75 years.

NATHAN TOWNSEND BUSHNELL, a New Haven hardware merchant and for many years one of the most prominent business men of that city, died February 23 at his home in Madison, Conn., from heart failure. For some months he had been gradually declining. He was a native of Madison and had reached the age of 78 years. When a young man his first business venture was as the master of a small sailing vessel. In 1850 he entered the wholesale grocery business in New Haven with his brother Cornelius. In 1860 the firm became Bushnell & Dewell. In 1877 Mr. Bushnell and Mr. Dewell dissolved partnership, Mr. Bushnell entering into business for himself, selling grocers' supplies. His next venture was in the hardware business. Although alone in the business he adopted the firm name of N. T. Bushnell & Co., and conducted a successful business. After two or three years he took into partnership Edward A. Todd. Mr. Todd resigning, Arthur Griggs and W. H. Burchell became associated with him. January 1, 1894, the business was incorporated as the N. T. Bushnell Hardware Company, Messrs. Griggs and Burchell remaining in the business. In 1900 Mr. Griggs retired and the business was reorganized, the present members of the Board of Directors being E. J. Griggs, H. F. Clark and W. H. Burchell. Mr. Bushnell's wife died in 1876 and he never fully recovered from the blow, retiring from business for a year at that time.

CHARLES W. HEALD, a pioneer manufacturer of Moline, Ill., recently committed suicide while mentally deranged. Mr. Heald was one of the founders of Williams, White & Co., established in 1854 as Williams, Heald & Co. Later, he was one of the organizers and president of the Moline Malleable Iron Works, now located at St. Charles, Ill. He was nearly 76 years of age.

ROLAND C. LUTHER, second vice-president of the Philadelphia & Reading Coal & Iron Company, died from apoplexy March 6, at Pottsville, Pa., aged 59 years. He was one of the best known mining engineers in the country.

WILLIAM EYSTER, president of Eyster, Weiser & Co., iron founders and machinists, York, Pa., died February 11.

The National Metal Trades Association.

Invitations have been issued by the National Metal Trades Association for its seventh annual convention, to be held at the Auditorium Hotel, Chicago, March 23 and 24. An especially important subject to engage the attention of those in attendance will be the relation of the local associations toward the National. At the Philadelphia convention last year a committee was appointed to devise a plan whereby the National and the local organizations might be more closely affiliated, and it is expected that such a plan will be submitted at the Chicago meeting. Commissioner Egan and Secretary Wuest have arranged a most interesting and timely list of topics to be discussed at the meeting.

At a meeting called by the Cincinnati members, composed of the leading machine tool builders of the city and vicinity and covering the seventh district, S. Egan of the J. A. Fay & Egan Company was elected chairman of territory within a radius of 100 miles of Cincinnati. Reports were compiled of all the manufacturers, which will be presented at the Administrative Council meeting. Another meeting has been called for one week prior to the date set for the convention. A private car will convey the manufacturers to Chicago to attend the meeting.

PERSONAL.

J. H. Ferguson has been appointed to succeed John Dowling, retiring, as manager of the Lookout Mountain Iron Company's furnace at Battelle, Ala. Mr. Ferguson had held the position of general superintendent of mines at Battelle.

O. A. Stranahan, who was recently appointed manager of the engine department of the Allis-Chalmers Company, has been promoted to the position of manager of the power department of the company, and will have charge of the entire commercial affairs of that department, with offices in Milwaukee. His department includes the reciprocating steam engines, steam turbines, condensers, gas engines, blowing engines and rolling mill engines.

Alexander B. Scully, president of the Scully Steel & Iron Company, Chicago, submitted to an operation for appendicitis March 2, at Passavant Hospital. The operation was successful and he is recovering satisfactorily.

George Hargreaves, who resigned March 1 as district manager at Detroit, Mich., of the American Car & Foundry Company, is succeeded by Wesley R. Mason. Mr. Mason has been identified with the company at Detroit for the past 17 years, and during the last few years was assistant district manager.

H. A. Taylor, Western manager for the American Screw Company, with offices at Chicago, left March 4 for a pleasure trip to the South, which will include Florida and Cuba.

Frederick A. Flather, who has been for some time superintendent of the plants of the International Harvester Company, Chicago, will sever his connection with the company March 15 and become treasurer of the Boott cotton mills at Lowell, Mass. He was originally a manufacturer of cotton mill machinery.

Clyde M. Carr, vice-president of Joseph T. Ryerson & Son, Chicago, is enjoying a rest at Pasadena, Cal. He does not expect to return to his business cares in Chicago until about May 1.

J. H. Duntley, president of the Chicago Pneumatic Tool Company, is taking a rest at Hot Springs, Ark.

S. C. Galley has been appointed auditor in charge of the accounting department of the Pittsburgh Coal Company, Pittsburgh.

F. E. Reed, president of the F. E. Reed Company, Worcester, Mass., and also of the Worcester Metal Trades Association, left Worcester February 24 for a trip to California for the benefit of his health.

Benjamin Atha, president of the Atha Steel Company, sailed for Europe March 4.

The Detroit Foundry & Mfg. Company and the Detroit Automatic Stoker Company, both at Detroit, Mich., have been consolidated under the name of the Detroit Stoker & Foundry Company and the combined capital stock has been increased from \$75,000 to \$110,000. It is the intention of the new company to extend the stoker business into new fields, but it is not likely that there will be any important addition made to the plant. Since the merger of the two companies was made reports have been current that the Detroit Automatic Stoker Company had gone out of business. This is not only untrue, but that branch of the business has been strengthened very materially by its consolidation with the other company. The officers of the new corporation are F. L. Bromley, president; J. W. Thompson, vice-president, and C. F. Lawson, secretary and treasurer.

It is announced that Vice-President John S. Hyde of the Bath Iron Works and J. R. Andrews of the Hyde Windlass Company, both at Bath, Maine, have bought the capital stock and full control of their companies from the Bethlehem Steel Corporation, and once more both companies are to be owned and operated by local people. These two companies were taken into the United States

Ship Building Company when it was organized and later with the other properties of that corporation passed into the hands of the reorganized company.

New Publications.

Producer Gas. A sketch of the properties, manufacture and uses of gaseous fuel. By A. Humboldt Sexton, F.I.C., F.C.S., professor of metallurgy in the Glasgow and West of Scotland Technical College; past president of West of Scotland Iron and Steel Institute. Publisher, the Scientific Publishing Company, Manchester, England. Cloth; 214 pages. Price, 10 shillings.

This book is based on the notes of a course of lectures on producer gas delivered by the author in 1902 at the Technical College, Glasgow. The subject matter is developed in a simple and easily comprehended manner from foundation principles. It begins with a chapter dealing with constituents of various fuel gases and gives a condensed explanation of the laws upon which the volume, pressure and temperature of gases depend, with simple examples illustrating their use. Equally important fundamental matter is contained in Chapter 2, which deals with thermal units, heat of combustion, calorific power, radiation, &c. With a knowledge of first principles once acquired, the author shows how practical questions on the best form or design of producer may be determined. The remainder of the book deals largely with typical producers, and in an appendix some of the latest forms are described. Among these are many patented types of producers, an understanding of the principles and details of which it is believed will be advantageous to the student and practical man that he may know what has already been done in this art, which the author feels is still in its infancy. The book will be found instructive and of value to those who are interested in the subject of gaseous fuel through the continually increasing attention which it is attracting.

Elements of Mechanics. Forty lessons for beginners in engineering. By Mansfield Merriman, professor of civil engineering in Lehigh University. Publishers, John Wiley & Sons, New York. Cloth, 172 pages. Price, \$1.

This is a book written for those who wish an understanding of the fundamental principles and methods of rational mechanics, but who have no knowledge of calculus. The only mathematics required to comprehend the problems presented is plain geometry, elementary algebra and plain trigonometry. It is particularly intended for manual training schools, freshman classes in engineering colleges and for young men in general who have the preparation just indicated. It has been the author's endeavor to appeal to the student's experience so that he can with ease acquire the mastery of the elementary laws of mechanics, giving him a foundation for a more extended course as his study in mathematics progresses. To make the work convenient as a text book the subject matter is conveniently divided into chapters and subdivided into articles, and with each article are given ten problems. Each article with its problems, therefore, forms a graded lesson. The chapters consecutively deal with concurrent forces, parallel forces, center of gravity, resistance and work, simple machines, gravity and motion, inertia and rotation. In an appendix are given answers to the problems, trigonometric functions and an index. In all the book is admirably compiled for the branch of the field of mechanics which it is intended to cover.

A Berlin cablegram states the belief that the German Government has inquired or is about to inquire, through Baron Speck von Sternburg, the German Ambassador to the United States, if a proposal to discuss a reciprocal trade arrangement would be favorably received in Washington. There is no disposition by Germany to expose itself to a refusal nor to place the United States in a position where it would be obliged to refuse, provided that the American Government regards the time inopportune. Therefore the German Ministry desires to learn informally how such a proposal would be treated.

January Iron and Steel Exports and Imports.

The January exports of iron and steel and manufactures thereof show quite a decrease as compared with those of the preceding month. The total value of such exports, excluding ore, as given by the Bureau of Statistics of the Department of Commerce and Labor, was \$8,957,989 in January, against \$10,399,308 in December. Taking the commodities for which quantities are given, the January exports only total 56,810 gross tons, as compared with 74,761 tons in December. The exports were very much less than during the months immediately preceding December. For instance, these exports in November reached 121,709 tons, in October 129,557 tons, and in September 131,886 tons. September was the month of high tide in our export trade. In that month the shipments to Canada were very heavy. The details for the month and for the seven months of the fiscal year ending with January are given in the following table:

Commodities.	January.		Seven months.	
	1905.	1904.	1905.	1904.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	10,458	6,742	37,770	19,664
Scrap.....	471	1,902	16,139	7,630
Bar iron.....	3,822	2,000	18,002	9,276
Wire rods.....	2	307	12,400	8,413
Steel bars.....	1,427	1,035	14,110	9,269
Billets, ingots, blooms.	8,981	17,184	151,137	21,977
Hoop, band, scroll....	286	196	1,887	1,202
Iron rails.....		605	27	740
Steel rails.....	12,232	4,960	292,735	31,512
Iron sheets and plates	285	204	2,615	3,739
Steel sheets and plates	2,874	1,423	40,332	7,554
Tin plates andterne plates.....	587	122	4,994	251
Structural iron and steel.....	3,780	2,340	38,091	17,021
Wire.....	8,308	7,602	67,468	62,004
Cut nails.....	395	788	4,976	5,671
Wire Nails.....	2,513	2,317	20,483	19,930
All other, including tacks.....	389	171	2,064	1,360
Totals.....	56,810	49,898	725,230	227,213

It is to be expected that for some time our iron and steel exports will show a decline, with our productive facilities drawn upon so heavily to supply home requirements that practically all blast furnaces and steel works in condition for operation are now running under high pressure. Hence it is evident that the export trade will receive considerably diminished attention.

The total value of exports for the seven months ending with January was \$76,517,058 against \$59,125,780 in the corresponding period of the previous fiscal year.

The imports of iron and steel and manufactures thereof, excluding ore, show quite an increase in January, although the figures are as yet not very heavy. The value for January was \$2,110,815, against \$1,675,889 in December. Taking the commodities for which quantities are given, the total for January was 24,337 gross tons against 17,696 tons in December. The increase in January was well distributed through the list of commodities. No particular article showed an exceptionally heavy gain. The detailed figures for the month and for the seven months of the fiscal year ending with January are given in the following table:

Commodities.	January.		Seven months.	
	1905.	1904.	1905.	1904.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	8,804	10,812	44,292	157,935
Scrap.....	1,370	827	6,251	20,861
Bar iron.....	1,739	2,781	12,689	23,542
Rails.....	667	1,740	7,996	24,651
Hoop, band and scroll	395	634	1,562	1,496
Billets, slabs, bars, &c., steel in forms n.e.s.	1,363	1,860	5,557	87,200
Sheets and plates....	202	749	1,243	7,822
Tin plates andterne plates.....	7,910	5,432	43,788	27,314
Wire rods.....	1,430	1,319	8,655	11,751
Wire and articles made from.....	326	441	2,063	3,177
Structural iron and steel.....	81	549	1,839	9,414
Chains.....	46	42	190	209
Anvils.....	4	5	87	170
Totals.....	24,337	27,191	136,212	375,542

* Included in "All other" prior to July 1, 1903.

The total value of imports of iron and steel and manufactures thereof, excluding iron ore, was \$12,640,588 in the seven months of the fiscal year ending with January, against \$17,895,247 in the corresponding period of the previous fiscal year.

The American Radiator Company.

The annual meeting of the American Radiator Company was held March 1 at Orange, N. J. James B. Forgan and Henry Bond of Chicago and James B. Dill of East Orange were re-elected directors.

The annual report of President Clarence M. Woolley shows that the company had the best year in its history, both as regards net profits and volume of business. The policy of deferring the payment of dividends on the common stock, in spite of generous earnings each year, until a substantial surplus had been reserved enables the company to present a very strong balance sheet. It shows that the surplus is equal to over 80 per cent. on its preferred capital, while the quick assets are over 90 per cent. of the preferred capital. The company began the payment of common stock dividends in November last at the rate of 4 per cent. per annum.

The statement for the 1904 fiscal year, ended January 31, 1905, and a comparison with the previous fiscal year are as follows:

	Assets.	1904.	1903.
Real estate, plants, machinery, patents, &c.....		\$7,337,437.73	\$7,353,963.00
Additions during year.....		363,415.70	83,474.73
Totals.....		\$7,700,853.43	\$7,437,437.73
Less depreciation.....		100,000.00	100,000.00
Net.....		\$7,600,853.43	\$7,337,437.73
Cash.....		\$252,364.08	\$229,046.06
Notes receivable.....		16,160.23	22,064.54
Accounts receivable.....		1,820,145.45	1,728,283.97
Raw material, supplies and finished products.....		1,314,625.10	949,190.72
Total quick assets.....		\$3,403,294.86	\$2,928,585.29
Total assets.....		\$11,004,148.29	\$10,266,023.02
Capital stock, preferred.....		\$3,000,000.00	\$3,000,000.00
Capital stock, common.....		4,893,000.00	4,893,000.00
Totals.....		\$7,893,000.00	\$7,893,000.00
Accounts and bills payable.....		609,261.75	316,136.62
Totals.....		\$8,502,261.75	\$8,209,136.62
Balance.....		\$2,501,886.54	\$2,056,886.40
Total quick assets.....		\$3,403,294.86	\$2,928,585.29
Less all accounts and bills payable.....		609,261.75	316,136.62
Net quick assets.....		\$2,794,033.11	\$2,612,448.67
Net profits.....		\$3,758,316.54	\$3,054,386.40
Less dividend preferred stock.....		1,207,500.00	997,500.00
Less dividend common stock.....		48,930.00	
Balance.....		\$2,501,886.54	\$2,056,886.40

President Woolley's report contains the following interesting statements:

The persistent efforts which we have made to secure a broader introduction of our products into old buildings, a field which is almost unlimited, have met with a larger result than ever before. Prominent among the influences employed in this connection is our advertising policy, which was largely expanded throughout the year, and to this cause we attribute a considerable part of the progress made. The advertising, or publicity work, is formulated along educational lines, and it is steadily creating in the public mind a sentiment in favor of steam and hot water heating systems as against older and cruder forms. It is necessary only to make homely statements of fact to arouse interest, which interest, followed by the various advertising methods, leads to desire, and at this point our selling organization converts such desire into actual sales.

Still further progress has been made during the past year in developing a broader spirit of co-operation as between all of the general departments, the plants, and the branches. This has brought about decisive advances in our processes of manufacturing, both as regards quality and cost, as well as a decrease in the cost of selling and distribution, enabling us to market a very much larger

volume of product on a smaller margin of profit than ever before. As we continue to make progress along these lines we shall be enabled to offer our wares to the public at lower prices, which will serve largely to increase the popularity of our methods of heating, and to hasten the time when such methods shall be utilized quite generally throughout this and other countries.

A new manufacturing plant has been completed and is now in partial operation at Litchfield, Ill. This will assist us adequately to provide for the larger demand which is being created. Our foreign business continues to grow, and the factory which was built in Germany to supply the greater demand has more than met our expectations and is being enlarged to meet the urgent requirements for a larger supply. This is also true of the plant which was built in France, where the line of industry is developing quite as rapidly as was anticipated.

The officers for the ensuing year are as follows: Clarence M. Woolley, president; John B. Pierce, first vice-president; Edw. A. Sumner, second vice-president; Charles H. Hodges, treasurer.

Finishing Open Hearth Heats.

Carl Stobrawa writes on the above subject in *Stahl und Eisen* as follows:

Owing to the introduction of the Talbot process and variations of the same it has become a question of importance whether there is any difference in quality between steel finished in the ladle and that finished in the furnace. Experience undoubtedly points to the conclusion that there is indeed a great difference in favor of the latter method, and the purpose of these lines is to explain the reason.

In working a heat the carbon in the bath is oxidized by the oxygen in the ore, the air and the metal itself. When decarbonization has reached the point desired the excess of oxygen is removed by ferromanganese. In what form is the oxygen present in the bath? The answer is: In the form of ferrous oxide dissolved in the metal, which acts as a solvent in a manner similar to that of water in a solution of salt. When metallic manganese is added the following reaction takes place:



The degree of oxidation of the manganese is higher than that of the iron—that is to say, the manganese compound is specifically lighter, rises to the top and goes into the slag; it may also be supposed that the solubility of the manganese compound in the metal is less than that of the iron compound. This reaction takes place the more readily the hotter the bath, or, as the melter would put it, the sharper the furnace runs the better the steel. For the most complete separation possible of the ferrous oxide time is necessary, generally from 5 to 12 minutes. These two essential conditions, temperature and time, are absent when the heat is finished in the ladle, apart from the fact that in the latter case a homogenous mixture of the materials added with the steel cannot be attained in the same degree as in a hot open hearth furnace under a proper covering of slag. In order to aid the separation of the oxides the heat is sometimes allowed to stand a short time in the ladle before being poured. The covering slag also has considerable influence on the quality of the material. If it is too heavy or too sticky some of the alloys added cannot pass through the same, and their action on the metal is either retarded or prevented altogether. If the ferromanganese, for instance, does not melt until the heat is partly tapped it may result in the last part of the metal being higher in carbon and manganese than the first, causing lack of homogeneity. This is most likely to occur when pig iron is used without scrap and the metal is worked and finished in the same furnace. This method of working entails a comparatively thick covering of slag unless especially favorable conditions exist, such as iron low in silicon and phosphorus and a rich ore low in silica. If shortly before the ferromanganese is introduced the roof should get too hot, a condition favored by a heavy slag body, and if the supply of air is diminished in order to lower the temperature, the slag will

become sticky and may easily prevent some of the alloy passing into the metal, whereby the certainty of a first-class product is endangered.

Finishing heats in the furnace, as was formerly general, led to an almost perfect certainty in results, and for this reason it is to be recommended that the process of using direct metal in the basic furnace be so arranged that this method can be retained. The newest developments in the use of molten metal consist of treating the same with oxidizing substances in a separate furnace, according to the Bertrand-Thiel process, or with an externally fired mixer and stationary open hearth furnace. In both cases the heat is finished in the furnace. Which of the two processes is the cheaper cannot be stated with any certainty. It may be pointed out, however, that in the fired mixer the removal of slag, which is a hindrance to the refining process, can be undertaken at any time. This is a point which is of considerable importance when using stock which yields much slag. Such a mixture makes the work more independent of any particular class of raw material. There is another question of far reaching economic importance, especially for open hearth plants where molten metal is not available and which are chiefly dependent on bought scrap—that is, whether firms which operate both blast furnaces and steel works will be able to cheapen the scrap process. And it must most probably be answered in the affirmative. If the scrap is spread evenly over the hearth with the limestone and the partly refined metal is poured over the same after it has become thoroughly heated, melting will be much hastened and the whole process shortened.

We are only now witnessing the real introduction of the iron and ore process, and it is by no means improbable that further improvements will be made which will decrease the cost of the preliminary refining and render available for acid furnaces, such as are used in steel foundries, a suitable molten metal.

Labor Notes.

As yet no settlement has been reached between the Amalgamated Association and the Whitaker-Glessner Company, operating sheet mills at Wheeling, W. Va., and Martin's Ferry, Ohio. The company claims that the limit of output in other sheet and tin plate mills is being violated and it refuses to operate its mills while this continues.

A bill has been introduced in the Wisconsin Legislature by one of the Socialist assemblymen of Milwaukee, providing that municipalities may, by ordinance, provide that eight hours shall be a legal working day on all municipal contracts. The bill is an outgrowth of the attempt made in the past year to require the insertion of an eight hour a day clause in the specifications for the contract to be let for new pumping engines for the water works department of Milwaukee. The Common Council of that city passed a resolution requiring that contractors should operate under the eight hour a day law, and as a result there was great delay in awarding the contract. The Milwaukee engine builders insisted that the ordinance was unconstitutional and carried the case to the courts, where they were successful. The bill, as introduced in the Legislature, is being vigorously opposed by the Milwaukee Metal Trades Association.

A new type of self clearing steel hopper car, built for the Buffalo & Susquehanna Railroad by the Pressed Steel Car Company, was tested recently by a party of railroad and steel company officials. The cars are side dumping, having doors at the bottom of each side. The doors are worked from the platforms, one-half being dumped from each platform. Two cars, each loaded with 95,000 pounds of coke, were emptied completely without manual assistance in about 30 seconds. It is thought that one-third of the cost of emptying each car can thus be saved.

Pig Iron Production Stationary.

A Further Decline in Stocks.

The production of pig iron in February was slightly below 1,600,000 tons, the falling off of course being primarily due to the short month but also to a moderate extent to many delays and troubles due to the weather. Stocks show a further decline of about 25,000 tons and the situation continues sound.

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Number of stacks.	Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York:					
Buffalo district....10	9	13,454	9	14,213	
Other New York....11	3	3,103	3	3,180	
New Jersey.....8	5	5,010	5	5,052	
Spiegel.....2	1	179	.1	186	
Pennsylvania:					
Lehigh Valley....27	17	10,650	18	10,920	
Spiegel.....2	2	450	2	390	
Schuylkill Valley....13	10	9,776	10	10,462	
Low. Susquehanna....10	5	6,549	5	6,218	
Lebanon Valley....11	2	1,912	2	2,162	
Spiegel.....1	0	0	0	0	
Pittsburgh district.39	38	99,375	37	100,700	
Spiegel.....4	4	3,000	4	3,942	
Shenango Valley....21	17	32,937	17	32,210	
West. Penn.....24	17	23,140	18	23,740	
Spiegel.....1	0	0	0	0	
Maryland.....5	3	5,737	3	6,036	
Wheeling district....13	11	23,466	11	23,934	
Ohio:					
Mahoning Valley....16	16	36,397	16	36,524	
Cent. and North. and					
Michigan.....18	13	27,171	13	26,626	
Hocking Valley....2	0	0	0	0	
Hanging Rock.....12	9	6,250	8	6,200	
Illinois.....21	17	36,910	16	35,100	
Spiegel.....1	1	1,434	1	700	
Minnesota.....1	1	978	1	1,203	
Wisconsin.....5	5	5,376	5	5,250	
Missouri.....1	1	997	1	1,000	
Colorado.....2	2	3,785	3	5,000	
Spiegel.....1	1	547	0	0	
The South:					
Virginia.....23	12	9,387	11	9,172	
Kentucky.....8	3	1,115	3	1,425	
Alabama.....44	25	26,800	25	27,176	
Tennessee.....16	13	7,145	12	6,430	
Georgia.....1	1	500	1	641	
North Carolina....1	0	0	0	0	
Totals.....375	264	403,530	261	405,792	

For a series of months the active anthracite and coke furnace capacity fluctuated as follows in gross tons:

	Coke capacity per week.		Coke capacity per week.
March 1, 1905.....	403,530	June 1.....	388,178
February 1.....	405,792	May 1.....	373,496
January 1.....	377,879	April 1.....	386,215
December 1, 1904....	357,846	March 1.....	347,424
November 1.....	334,249	February 1.....	335,339
October 1.....	319,249	January 1, 1903....	346,073
September 1.....	291,573	December 1, 1902..	336,617
August 1.....	246,092	November 1.....	330,110
July 1.....	272,301	October 1.....	337,837
June 1.....	336,197	September 1.....	328,243
May 1.....	368,244	August 1.....	328,745
April 1.....	337,257	July 1.....	303,793
March 1.....	308,751	June 1.....	337,492
February 1.....	273,692	May 1.....	337,627
January 1, 1904.....	185,634	April 1.....	331,140
December 1, 1903....	244,156	March 1.....	316,039
November 1.....	273,715	February 1.....	325,440
October 1.....	353,142	January 1, 1902....	291,992
September 1.....	360,197	December 1, 1901..	317,358
August 1.....	353,681		
July 1.....	384,825		

There were blown in during February one Donora in Pittsburgh, Max Meadows in Virginia, Belfont in the Hanging Rock region, one Calumet in Illinois and one Dayton in Tennessee. Gadsden in Alabama was also started. There were blown out one Dock Ridge in the Lehigh Valley, one Cambria and one Bessemer in Alabama.

We estimate the production of coke and anthracite pig iron as follows, from nearly complete official returns:

Monthly Pig Iron Production.

	October (31 days)	November (30 days)	December (31 days)	January (31 days)	February (28 days)
New York...	63,701	67,735	72,752	77,159	66,230
New Jersey..	29,744	28,308	21,464	23,841	20,037
Lehigh Valley	37,270	39,069	44,581	53,207	49,197
Schuylkill Val.	29,081	39,165	45,335	44,956	39,102
Lower Susquehanna and					
Lebanon Val.	43,319	41,526	39,999	37,318	34,161
Pittsburgh dis.	402,880	382,316	412,433	461,490	411,135
Shenango Val.	100,557	106,326	131,417	144,278	131,748
West. Penn..	78,451	82,787	92,478	98,765	96,551
Md., Va. and					
Kentucky ..	44,547	51,499	66,105	72,601	62,170
Wheeling dis.	64,401	64,517	86,306	105,995	93,865
Mahoning Val.	109,918	129,774	149,397	161,462	145,590
Cent. and No.	91,182	98,610	103,522	121,902	97,638
Hocking Valley					
and Hanging					
Rock	22,406	24,295	27,336	27,730	22,157
Ill., Mich., Minn.,					
Wis., Mo. and					
Col.	199,125	192,488	184,873	200,631	199,104
Alabama	116,507	115,789	114,670	117,575	99,624
Tennessee, No.					
Carolina and					
Georgia	22,181	22,401	23,339	31,232	28,624
Totals ..	1,455,270	1,486,605	1,616,007	1,780,142	1,596,933

* Two small furnaces estimated with a monthly production of 4700 tons.

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Ashland, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of product month by month. We present also separately monthly figures of the production of spiegel-eisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Plg.—Total production.—					Spiegeleisen and ferromanganese.	
	1903.	1904.	1905.	1904.	1905.		
January....	502,994	1,129,042	6,673	21,002			
February....	756,260	1,027,937	12,961	22,431			
March.....	913,412		23,128				
April.....	966,850	974,006	29,145				
May.....	1,037,325	927,534	25,755				
June.....	1,021,839	788,822	24,950				
July.....	987,855	694,892	27,284				
August.....	993,564	747,570	19,280				
September..	956,363	936,494	20,723				
October....	829,215	971,447	13,669				
November...	553,067	962,384	13,442				
December...	406,730	1,019,841	13,325				

Deducting from the total monthly production the output of the steel companies we reach the following series of figures, which represent closely the make of the merchant furnaces. Taking into account the fluctuations in the stocks, we arrive at the apparent consumption from month to month:

Statistics of Merchant Furnaces.—Gross Tons.

	1904.	Production.	Stock.	Apparent consumption.
January.....	420,657	—	21,615	442,272
February.....	452,151	—	45,722	497,873
March.....	538,005	—	71,364	609,369
April.....	587,081	—	13,688	600,769
May.....	609,461	—	101,433	508,028
June.....	506,917	—	75,104	431,813
July.....	515,927	—	49,960	465,967
August.....	425,175	—	39,743	464,918
September.....	421,348	—	73,883	495,231
October.....	483,823	—	26,656	510,479
November.....	524,221	—	70,198	594,419
December.....	596,400	—	55,760	652,200
Totals.....	6,081,166			6,273,338
1905.				
January.....	651,100	—	26,594	677,694
February.....	568,996	—	25,694	594,690

Stocks.

Believing that a classification of the merchant stocks by general geographical divisions would aid in a correct appreciation of the situation, we have arranged them in three groups: The Eastern, which includes New York, New Jersey and the Schuylkill, Lehigh, Lower Susquehanna and Lebanon valleys; the Central Western and Northwestern, which includes western Pennsylvania, the Shenango and Mahoning valleys, the Hanging Rock region, central and Northern Ohio, and Michigan, Illinois, Wisconsin, Minnesota and Missouri; and the Southern, which includes Virginia, Kentucky, North Carolina,

Georgia, Alabama and Tennessee. The stocks, of course, do not include the holdings of the steel companies:

	Merchant Furnace Stocks.				
	Nov. 1.	Dec. 1.	Jan. 1.	Feb. 1.	March 1.
East	88,980	88,142	84,967	85,054	79,996
Central and North-west	247,769	210,080	174,729	156,455	135,861
South	192,284	160,572	143,338	134,931	134,889
Totals	529,033	458,794	403,034	376,440	350,746

The Motor Boat and Sportsmen's Show at New York.

The eleventh annual Motor Boat and Sportsmen's Show opened at Madison Square Garden, New York City, Tuesday, February 21, and closes Thursday, March 9. For many reasons it is considered the most successful in the series so far held, for in attendance and amount of business done by exhibitors it has exceeded the figures of previous years. A large number of applications for space in next year's show have already been received, and there is every prospect that the twelfth annual show will be an even greater success. Among the new features will be a still larger lagoon, and the engine exhibits will be placed in the basement to give more room on the main floor for boat exhibits. The present lagoon is a continuous canal 26 feet wide on the side stretches and 30½ feet wide at the ends, but it has been overcrowded and many of the boats have been unable to make the turns at the ends without backing and maneuvering. In other respects the show will be much as heretofore, with the usual exhibitions of wild animals, live fish, guns, sportsmen's goods and camping outfits.

The launch and boat exhibits have been notable for the increasing tendency toward higher speeds. The auto-boat, so called for its points of resemblance to an automobile, is very much in evidence, with its thin shell and narrow lines. As indicated by the sales, the public, however, still seems to prefer the more commodious, though slower, pleasure craft. Both for comfort and price these appeal to the purchaser of moderate means. The average price of such boats is from \$500 to \$1000, and the speed they are capable of attaining is in general from eight to twelve miles an hour. One of the questions of interest that has come up during this show and has been widely discussed is the advisability of installing motors in life saving boats. Popular opinion is generally in favor of it, and it is probable that experiments in this direction will be undertaken in the near future.

The greatest improvement in the boats, as a rule, has been in the equipment, the engines being generally improved and of lighter weight and higher power. The electric launch, though present, is decidedly in the minority, although it cannot be gainsaid that its smoothness of running and absence of disagreeable exhaust are greatly to be desired in a pleasure boat.

Among the several new things to be seen, one of the most striking is a new form of propeller, claimed to be more efficient than the screw of ordinary form, to make less commotion in the water and to have the same power on the reverse as on the forward movement. One builder shows a motor which is reversible directly, so that a reversing gear or a reversible propeller is not necessary. Two or three new reversing gears are shown, each of which has its peculiar advantages. Another concern shows a reversible three-blade propeller, recently patented, the mechanism of which is inclosed and protected, and the exterior carefully designed to avoid the catching of eel grass or floating matter in the water. One motor proved its ability to operate for prolonged periods by running continuously from 10 a.m. to 11 p.m. every day since the show opened.

A New Furnace at Mingo.—There has just been authorized the building of a fourth blast furnace at the Mingo works of the United States Steel Corporation, the estimated cost being \$1,090,000. The plant was originally laid out for four furnaces, the ore handling plant, &c., being adequate for that extension. It is estimated that the capacity of the furnace will be 500 tons per day.

NEWS OF THE WORKS.

Iron and Steel.

The Western Tube Company, Kewanee, Ill., has purchased the stock and machinery of the Scott Drive Well Point Company of Chicago and removed the business to Kewanee. The Scott Company made well points, which are largely made from pipe, so that its business bears a close relationship to that of the Western Tube Company. Skilled employees familiar with the manufacture of well points have removed from Chicago to Kewanee, and the total force in this department will number from 25 to 30 men.

All the iron plants at New Castle, Pa., are reported as running full time and making a good output.

The Reading Iron Company will continue its improvements to its Scott works, Reading, Pa., this year. Some electrical machinery will be added.

Sharon Steel Hoop Company, Sharon, Pa., has just completed the installation of a fifth 35-ton acid open hearth furnace. The other four acid furnaces in this plant have been increased about 20 per cent. in capacity, bringing their output up to 30 tons each per heat. The five open hearth furnaces are expected to turn out about 9000 tons of acid open hearth steel per month. The company is also installing a 10-inch Morgan continuous mill for rolling hoops and bands, which is expected to be in operation not later than June 1. The product of the works consists of acid open hearth billets, sheet and tin bars in random lengths, hoops, bands and cotton ties.

In one turn recently the 40-inch blooming mill at the Donora works of the Carnegie Steel Company, at Donora, Pa., turned out 421 tons of steel. From the fact that this plant has been running only a short time it may be regarded as a very creditable record.

The Duncannon Iron Company lighted the fires in its new puddle mill, at Duncannon, Pa., on Monday night.

The National Consolidated Wire Company has been organized with \$8,000,000 preferred and \$8,000,000 common stock by the National Steel & Wire Company, New York. Beyond the incorporation of the new company the plans of the incorporators have not been definitely formulated, but it is expected that within the next 30 days an announcement will be made.

It is reported that the rolling mills of the Republic Iron & Steel Company, in Birmingham, Ala., have been shut down.

The Mitchell-Diggins Iron Company, Cadillac, Mich., has incorporated with a capital stock of \$200,000. Details of the company's plans for establishing its new charcoal furnace were noted in these columns a few weeks ago. The officers are: J. C. Ford, Fruitport, president; W. W. Mitchell, vice-president; Edward Fitzgerald, secretary, and D. F. Diggins, treasurer.

The Board of Trade of Reading, Pa., has appointed a committee to investigate the establishment of a new steel plant in that city. Peter D. Wanner, J. H. Cheetham, William F. Remppis, W. M. Leinbach and I. S. Brandt are in charge. Howard B. Thompson of Reading stated to the organization that a plant could be established for the making of a new process of steel and suggested \$250,000 capital for the new company.

Work is going ahead night and day on the repairs to the furnace of the Robesonla Iron Company, Limited, at Robesonla, Pa., and it will be started soon.

The Lackawanna Iron & Steel Company has started its No. 1 furnace at the Colebrook plant, Lebanon, Pa., and another furnace will probably be blown in at the same plant before the end of this week. One of the Cornwall furnaces will be started soon. After that two more furnaces operated by the same company in the Cornwall region will be put into blast if needed.

The Pennsylvania Steel Company has closed down one of its furnaces at Lebanon, Pa., for repairs. Both of the company's stacks at Lebanon are now idle, but from all indications one will be started soon.

The Rome Merchant Iron Mill, Rome, N. Y., has let a contract to the American Bridge Company for rebuilding its plant, which was recently destroyed by fire. The new mill will be entirely of steel and fire proof in every particular, and it is expected that it will be ready for operation about the middle of June.

General Machinery.

The Chicago Addition Mangle Company, Chicago, has been incorporated with a capital stock of \$10,000 by C. T. Gilmore, C. W. Anderson and W. H. Lutes. The company has offices at 56 West Washington street, where it will sell laundry machinery to be manufactured under contract.

The Vulcan Machine & Foundry Company, Birmingham, Ala., capitalized at \$10,000, has purchased the Wulbern plant and will do a general machine and foundry business. Edwin A. Wingate is president and George W. Hays secretary and treasurer.

The Pennsylvania Engineering Works, New Castle, Pa., is receiving an increased number of orders, and is putting many men back to work who were laid off in November and December.

The business of R. S. Petty, Greensboro, N. C., dealer in engines, machinery, &c., has been taken over by the Petty-Reid Company, recently incorporated with a capital stock of \$50,000. The incorporators are S. R. Petty, J. E. Logan, B. S. Campbell, T. R. Hardin, D. F. Reid and J. P. McAdams.

The Perth Amboy Foundry & Machine Company, Perth Amboy, N. J., has incorporated with capital stock of \$100,000 to do a general foundry and machine shop business. The company has secured a large tract of land with the necessary buildings and is installing machinery with the intention of putting the plant in operation about April 1. Peter A. Johansen is president and treasurer; Hugh Dickson, vice-president, and Mary L. Johansen, secretary.

The Chattanooga Machinery Company, Chattanooga, Tenn., reports that its Catlin keyseater is now in use in machine shops in all parts of the world.

The Buffalo Forge Company, Buffalo, N. Y., has recently closed a contract for furnishing 24 electric blowers for ventilating service to be installed on the battle ship Indiana. The company is also furnishing heating and ventilating equipments for the following St. Louis, Mo., schools: Adams School, Longfellow School, O'Fallon School, Horace Mann School and Teachers' College, and a mechanical forced draft equipment for the Eastern Steel Company, Pottsville, Pa.

Work on the new plant of H. S. Kerbaugh, near Bellwood, Pa., is progressing as fast as the weather will allow. The storehouse, 50 x 208 feet, is about completed, and a large part of the frame work for the machine shop is in place. This latter building is to be 120 x 230 feet, and the foundry, the foundations for which are in, will be 50 feet square. It is expected the entire plant will be in operation by May 1.

The Reading Radiator Company has arranged to build a machine shop, 60 x 135 feet, at Reading, and a permit has been issued by the city for the work.

The High Duty Saw & Tool Company is the name of a new corporation chartered by the State of Pennsylvania, to manufacture high grades of tools. Its works are located at Eddystone, near Chester, Pa.

The Buffalo & Susquehanna Railway Company, Buffalo, N. Y., has completed the erection of its boiler and blacksmith's shop and has purchased all the machinery which it contemplates installing at the present time.

Power Plant Equipment.

The Lackawanna Mfg. Company, 1208 West avenue, Newburgh, N. Y., which was recently incorporated for the manufacture of gasoline engines and motors for use in boats, automobiles and for stationary purposes, has taken over the plant of the Lackawanna Valveless Motor Company at Buffalo, which it will continue to operate until the fall, at which time the new company expects to move the entire business to the city of Newburgh, where the company will probably erect new buildings.

The Allis-Chalmers Company, Milwaukee, Wis., has recently received an order from the Oliver Iron Mfg. Company, Duluth, Minn., for four new Reynolds Corliss cross compound engines of the heavy duty type with cylinders 18 and 34 inches in diameter and 34-inch stroke. The engines are to be used in the Oliver Company's mines and were rendered necessary by an increase in production. The South Shore Electric Company has ordered from the Allis-Chalmers Company a heavy duty 24 x 48 inch engine for direct connection to a 428-kw. Bullock alternating current generator to be installed in its power house at Hammond, Ind., and the People's Power Company, Moline, Ill., has awarded a contract to the Allis-Chalmers Company for a horizontal compound Reynolds Corliss engine 24 x 50 x 48 inches for direct connection to a generator.

Harris E. Thomas and Elgin Mifflin, Lansing, Mich., were the highest bidders for the property of the Lansing Boiler & Engine Works, which was adjudicated a bankrupt. Their offer of \$14,850 is subject to the approval of Judge Swan of the United States District Court at Detroit, but it is presumed that the sale will be ordered.

The Jackson Engine & Motor Company, Jackson, Mich., has increased its capital stock to \$60,000, just doubling it. The company has purchased a new factory site at the corner of the Belden road and Bridge street, and on it will erect a factory building 60 x 300 feet. The building will cost about \$20,000 and will be equipped with \$15,000 worth of machinery. Engines are now being made in from 3 to 25 horse-power, but when the new plant is completed it is expected to make them as heavy as 50 horse-power.

The Valley Traction Company may add another engine to its plant. M. C. Kennedy, Chambersburg, Pa., is president.

The Birmingham Equipment Company, Birmingham, Ala., has secured the agency for the Buckeye Engine Company, Salem, Ohio, for the States of Alabama, Georgia and Mississippi.

The Harrisburg Foundry & Machine Works has taken its fourth order for a 450 horse-power Fleming four-valve engine to be used in the power plant of the Centre & Clearfield Railway Company. The same Pennsylvania company has taken orders for the plants of the Chartiers Coal & Coke Company, American Ice Company, Baltimore Brewing Company and the Los Angeles & Pacific Electric Railway Company.

Since January 1 the Westinghouse Machine Company, with works at East Pittsburgh, has entered some unusually large orders for Westinghouse gas and steam engines and steam turbines. During the months of January and February this company received a larger number of orders than ever before in a similar time, the bulk of the business being for turbines, the orders for which since the first of the year aggregate nearly

100,000 horse-power. So large has the turbine business grown that additional boiler capacity has become imperative to enable the company to handle its large contracts. A battery of 5000 horse-power boilers will be added to the East Pittsburgh plant, and the company will then be able to test at one time turbines of an aggregate capacity of 12,000 horse-power. The size of this operation may be better understood when it is known that in testing such a number of turbines it is necessary to use every day 20,000,000 gallons of water for cooling the condensers. Among recent large orders for turbines were those placed by the Indian Electric Company, Indian Harbor, Mass.; Gray Mfg. Company, Gastonia, N. C.; Henrietta Mills, Henrietta, N. C.; Grace Harbor Electric Company, Grace Harbor, Wash.; Rhode Island Company, Providence, R. I., and Philadelphia Rapid Transit Company. These contracts have necessitated the placing of more men at work at the foundry of the Westinghouse Machine Company at Trafford City. It is stated that within a comparatively short time the Allegheny foundry will be removed to Trafford.

New engines, boilers and probably some shafting will be installed in the new factory which the Philadelphia Caramel Company, Philadelphia, Pa., is to erect at Camden, N. J. The building will be a two-story structure, 80 x 200 feet.

Bridges and Buildings.

Contract for the new Cleveland street bridge at Ionia, Mich., has been let to the Massillon Bridge Company, Massillon, Ohio. It, together with some other improvements to be made, will cost \$26,000.

The Chicago, Rock Island & Pacific Railroad will soon commence the erection of a \$35,000 bridge across the Des Moines River at Harvey, Iowa. The bridge will be of two steel spans, 155 feet each in length. The work is in charge of Karl J. C. Zinck, division engineer.

The Reliance Construction Company has been organized at Fowler, Ind., with L. J. MacMillan, C. E. Flora and G. R. Whitaker, all of Indianapolis, as stockholders.

Foundries.

The Aurora Foundry Company, Aurora, Ill., is making improvements to its present works, which will make the foundry building 70 x 200 feet. A pattern shop, 30 x 60 feet, and a new office building are also included in the additions.

The South Bend Malleable Iron Works, South Bend, Ind., which has been making improvements to its works, will in future supply all the needs of the Studebaker Brothers Mfg. Company for malleable iron work.

Abendroth Brothers, New York, will build a new molding shop, 90 x 175 feet, at their plant at Newburgh, N. Y., as soon as weather conditions will permit. Plans are also being prepared for a brick and steel warehouse and machine shop, 50 x 140 feet, six stories.

The Carroll Foundry & Machine Company, Bucyrus, Ohio, will erect a new steel foundry, 130 x 300 feet, and will buy considerable new equipment for it.

The Bellefontaine Foundry & Smith Company, Bellefontaine, Ohio, has increased its capital stock from \$50,000 to \$75,000.

Wm. Dixon, Adams, N. Y., has sold his machine shop and brass foundry to Frazier Brothers, who will considerably improve the plant and will install an iron foundry. Besides the making of brass and iron castings the new owners will manufacture green bone and vegetable cutters of their own invention.

Fires.

The plant of the Bay State Belting Company, Boston, Mass., sustained a loss of \$12,000 by fire last week.

The car barn of the Massachusetts Traction Company, Manchester, N. H., was burned March 4 with a loss of \$150,000, including equipment.

The plant of the Oriental Emery Company, Derby, Conn., was destroyed by fire last week, with a loss of \$20,000.

The Fort Payne Stove Foundry, Fort Payne, Ala., was recently destroyed by fire.

Charles P. Woolston's carriage factory, at Riverton, Pa., was destroyed by fire March 6. The loss is estimated at \$25,000.

The Page ore mill, at Florence, Col., owned by the Florence Milling & Leasing Company, was destroyed by fire March 5. The loss is estimated at \$70,000.

The Bryan Cotton Oil Company's plant, at Bryan, Texas, was destroyed by fire March 4. The loss is about \$150,000.

On March 5 an explosion wrecked the municipal electric light plant at Jacksonville, Fla.

The large plant of the American Cereal Company, at Cedar Rapids, Iowa, was almost entirely destroyed by fire on March 7.

Hardware.

The Tuthill Spring Company of Chicago celebrated the twenty-fifth anniversary of the establishment of its business by moving on March 1 into its new building. The building is 200 feet front on West Polk street and is 119 feet deep, with an ell 25 x 80 feet, running through to Mather street. The building is so arranged that teams loaded with steel may drive into the building on the southeast. The stock then moves north and west and so around the building and comes out on the southwest side through the shipping room.

Miscellaneous.

The Carnegie Steel Company, Pittsburgh, has placed contracts for the erection of a water purifying plant at its Duquesne Steel Works, Duquesne, Pa. The plant will be very similar in design to the one erected recently by the National Tube Company at McKeesport, Pa., and is designed to overcome the trouble experienced from the acids and other impurities in the water secured from the Monongahela River. The plant will have an hourly capacity of 150,000 gallons. The purifying tank will be 27 feet high and 49 feet in diameter and will be built on the side of the river. Three storage tanks will be built for storing purified water, each 46 feet high and 45 feet in diameter.

A company is being formed in Cincinnati, with \$500,000 capital stock, for the purpose of purchasing and moving to that city the large rubber manufacturing department of the Whitman-Barnes Company, Akron, Ohio.

There is talk of making extensive improvements to the city of Hamilton, Ohio, gas plant. Superintendent Andrews of the Board of Public Improvements can probably give further information.

The Pittsfield Spark Oil Company, Pittsfield, Mass., whose plant was recently destroyed by fire, will resume business on the third floor of the Whittlesley Building, formerly occupied by the Stanley Company. All the required new equipment has been purchased.

The recent increase of capital stock of the Lozier Motor Company, New York, from \$500,000 to \$1,100,000, is for the purpose of providing additional working capital. Over \$500,000 of the increased capital stock has been subscribed for and will be paid in March 1.

A small quantity of new machinery will be required by the Wilmington Sash, Door & Blind Company, Wilmington, Del., which is to build a large new warehouse.

The St. Croix Paper Company is to build a large plant at Sprague's Falls, Maine, to comprise grinder, sulphide and paper mill, and a machine shop.

The Churchill & Alden shoe factory, Brockton, Mass., is to be enlarged by a three-story addition 40 x 100 feet.

The Hood Rubber Company, Watertown, Mass., plans to make large additions to its plant this season.

The Fore River Shipbuilding Company, Quincy, Mass., at its first annual meeting since the reorganization, has elected the following board of officers: President, F. T. Bowles; general manager, H. G. Smith; treasurer, J. A. Sedgwick; clerk, S. T. MacQuarrie; directors: Gordon Abbott, Admiral Bowles, T. J. Coolidge, Jr., F. C. Dumaine, William Endicott, Jr., W. C. Fish of the General Electric Company, W. A. Gaston, Robert Winsor and Arthur Wainwright.

The Holyoke Cast Iron Brazing Company, Holyoke, Mass., has been organized to conduct a business of brazing metals of all kinds, especially cast iron, under a process invented and perfected by John W. Hopper of that city. Quarters have been secured in the shop building of the Novelty Machine Company, Front street, formerly occupied by the National Nickel Plating Company. The process is a new one and is said to accomplish very strong and generally excellent results.

C. H. Evans, Chicago, is making plans for a \$200,000 gas plant to be built at Jackson, Miss., for A. C. Jones, C. A. Bonds and others.

Richard Loewenthal, dealer in old metals, rubber and rags, Chicago, is having a five-story factory building erected at the southwest corner of Twentieth and Sangamon streets. The building will cost \$50,000. It will be 80 x 100 feet, of mill construction. Paul F. P. Mueller, Schiller Building, is the general contractor and Adler & Alschuler the architects.

The Alert Fire Appliance Company, Buffalo, N. Y., has been incorporated with a capital of \$5000 to manufacture patented fire fighting appliances and apparatus. Incorporators, L. F. Radford and Gordon F. Matthew, Buffalo, and James H. Byrne, Toronto.

The Baltimore Journal Box Company has been incorporated at Baltimore, Md., with a capital of \$150,000. Incorporators, Jno. W. Woodland, Elbridge S. Johnson and Wm. D. Allen.

The Kokomo Boiler Compound Company, Kokomo, Ind., has incorporated for \$25,000, to manufacture and sell a boiler compound to remove scale from boilers. The incorporators are Wm. H. Brandon, Wm. H. McReynolds and H. B. Reber.

The Hastings Gas Company, Hastings, Mich., will build a new gas plant. F. W. Freese, Ft. Wayne, Ind., has been selected as engineer.

The Missouri Iron & Metal Company has incorporated at St. Joseph, Mo., to deal in scrap iron, metals, rubber, rags, and all kinds of junk. M. J. Farber is president and treasurer, N. Eisen, vice-president, and J. Ungerman, secretary.

The National Railway Appliance Company, New York, has been organized to conduct a general railway supply business. The company does not intend to manufacture, but will simply act as selling agent. The present address is care of Benjamin A. Hegeman, Jr., Plainfield, N. J.

The Sill Pneumatic Horse Collar Company, Bloomington, Ill., has organized to manufacture a patented horse collar made principally of sheet steel. The company has secured a building with 11,500 square feet of floor space, which it is putting in shape to receive the machinery, which is special and was made mostly by the Toledo Machine & Tool Company, Toledo, Ohio. The equipment will be installed some time during this month, when the collars will be put on the market. E. L. Sill is president; W. B. Sill, vice-president; Sam'l Fesler, treasurer, and D. M. Sill, secretary and general manager.

The recent fire at the works of the Whitman Agricultural Company, St. Louis, Mo., did but little damage and interfered in no way with manufacturing. No new machinery is required.

The Utah Construction Company, Ogden, Utah, general railway contractors, has about completed the rebuilding of its plant, which was recently destroyed by fire.

Williams & Bridges, Worcester, Mass., manufacturers of wooden and paper boxes, contemplate the erection of an addition to their shop, to be three stories and about 40 x 70 feet. New machinery will be required for the addition.

The Golbert Last Company, successor to R. K. Golbert & Co., last manufacturer, Worcester, Mass., contemplates increasing its manufacturing facilities, including the addition of new tools.

The Chicago, Rock Island & Pacific Railroad has practically completed the erection and equipment at Chicago of the following buildings: A three-story brick and steel grain drier building, 29 x 47 feet; boiler room, 41 x 60 feet, and coal storage shed, 26 x 36 feet, covered with corrugated galvanized steel. The following equipment has been purchased: From John Mohr & Sons, Chicago, two 125 horse-power horizontal return tubular boilers; pneumatic grain drying apparatus from the Hess Grain Drying Company, Chicago; two screw conveyors, connecting all legs of elevator with drier, furnished by the Weller Mfg. Company, Chicago. The work also included the erection of a 140-foot steel stack.

The Monterey Steel Company, Monterey, Mexico, has laid foundations for 60 coke ovens, which it is expected will be in operation in four months. Another lot of 60 will soon be started, and when the total of 120 ovens is completed the company will be able to supply not only its own needs but to put coke on the market. The capacity of the ovens will be from 2 to 5 tons every 24 hours. The coke brings 30 pesos per ton at Mexico City.

The Beall Non-Pounding Frog & Crossing Company, Incorporated, South Bend, Ind., which is capitalized at \$500,000, held a meeting of its stockholders recently and elected the following directors: S. M. Robinson, H. M. Kauffman, George H. Alward, Adam Hunsberger, John H. Chandler, A. M. Beall and J. W. Fitzgibbon. Subsequently the directors elected the following officers: Mr. Robinson, president; Mr. Kauffman, vice-president; Mr. Chandler, second vice-president; Mr. Beall, third vice-president; Mr. Fitzgibbon, secretary, and Mr. Alward, treasurer. This company was formed about two years ago for the manufacture of A. M. Beall's nonpounding crossing frog. Efforts to finance the company for that single purpose were not successful. Last fall the present directorate secured control of the company, purchased sole ownership in the patents, and at the recent annual meeting took charge of affairs. The present management is now looking up the matter of location, preparing plans for buildings and getting ready to purchase machinery to manufacture a full line of railway track supplies for both steam and electric railways in connection with the Beall crossing frog. The company has had under advisement the use of the Elkhart Frog & Crossing Company's plant at Elkhart, Ind. East Chicago and other cities have made good offers, with considerable financial assistance, but careful investigation is to be made before the final location of a plant is decided on.

The Barth Mfg. Company, Milwaukee, Wis., has changed its name to the Barth Elevator Company, and will hereafter concentrate its efforts on the building of passenger and freight elevators.

The E. Van Winkle Gln & Machine Works, Atlanta, Ga., has leased a warehouse on Pacific avenue, Dallas, Texas, from which it will supply the trade in that section. John Williams Taylor, the company's sales agent for Texas and Oklahoma, will have charge of the Dallas office and warehouse. The company makes cottonseed oil machinery, cotton gins, presses, fertilizer machinery and the like.

The Lencas Iron Company and the Tobas Iron Company, both of Duluth, Minn., have filed articles of incorporation, the former with a capital stock of \$50,000 and the latter with a stock of \$30,000, the incorporators being George P. Tvedt, William J. Stevenson and P. M. Martin.

P. L. Kimberly and J. V. Rose of Sharon, Pa., are among the prime movers in a company which is now being organized to erect a modern brick plant at East Oakland Cal. The product will be used in blast furnace and steel mill construction in the Far West, and the plant is to cost \$150,000.

Owing to the resumption of furnaces the Slesholtzville iron ore mines in the Schuylkill Valley, Pa., have been started again and a 400-foot shaft will be sunk at once.

The Iron and Metal Trades

Our monthly blast furnace returns reveal a continuance of the strong statistical position in the Pig Iron industry. The February production, covering as it did only four weeks, was only 1,597,000 tons, as compared with 1,780,000 in January. It fell below the normal because a considerable number of plants were affected by troubles incident to the handling of materials in winter weather. Roughly, this amounts to about 25,000 to 30,000 tons, and it is a curious fact that the stocks in the hands of merchant furnaces declined about 25,000 tons. In other words, consumption apparently during February was proceeding at a rate which would have taken care of the normal output of the furnaces in blast. Productive capacity on March 1 was very close to that of February 1, so that for the present it is stationary. There is still some capacity available, but resumption is being hampered by the same causes which have slightly checked output.

The fact of the extraordinary consumption of Pig Iron, reflected in the statistics, is confirmed by the circumstance that melters very generally are ordering shipments freely and in some cases urgently. It is only in isolated instances that delays are demanded.

While in the Eastern markets the feature is still the buying for prompt delivery in moderate quantities by the general foundry trade, the Western distributing markets report a larger movement among some of the leading melters, the jobbing foundries, however, participating also. Both Cincinnati and Chicago have been quite active. The Westinghouse interests in Pittsburgh have bought some round lots of Charcoal and Coke Irons, the aggregate being fully 25,000 tons.

For Steel making the volume of purchases of Pig has not been large. It is understood that the Steel Corporation may need 10,000 tons more for March, and there were indications of requirements aggregating 40,000 tons for April. These, however, will not come up at once. No buying on the part of this interest in the East has been done, and the alternative of starting the Troy furnaces is under consideration.

There has been a further movement in Steel Rails. It is understood that the Atchison, Topeka & Santa Fé road has bought 25,000 tons, and that negotiations with the St. Paul and other Northwestern and some Southwestern roads are pending which will involve about 100,000 tons.

In the Structural trade an interesting new feature is the appearance of a considerable number of inquiries for Steel buildings for manufacturing purposes. It is definitely known that about 22,000 tons of this class of work will soon be in the market.

The enormous pressure upon the finishing plants of the leading producers from domestic sources has made it necessary to restrict export sales to the quantities absolutely necessary to maintain the foothold acquired in foreign territory. Thus, while during the last year the United States Steel Corporation was shipping abroad at one time at the rate of 100,000 tons per month, commitments are now being kept down to the rate of from 55,000 to 60,000 tons per month.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

PIG IRON:	Mar. 8, Mar. 1, Feb. 8, Mar. 9, 1905. 1905. 1905. 1904.			
Foundry Pig No. 2, Standard, Philadelphia	\$17.50	\$17.50	\$17.50	\$14.75
Foundry Pig No. 2, Southern, Cincinnati	16.25	16.25	16.25	12.00
Foundry Pig No. 2, Local, Chicago	17.50	17.50	17.50	13.25
Bessemer Pig, Pittsburgh.....	16.35	16.35	16.35	13.85
Gray Forge, Pittsburgh.....	16.00	16.00	15.85	13.25
Lake Superior Charcoal, Chicago	18.50	18.50	18.50	15.00

BILLETS, RAILS, &c.

Steel Billets, Pittsburgh.....	24.00	24.00	23.00	23.00
Steel Forging Billets, Pittsburgh	26.00	26.00	25.00
Steel Billets, Philadelphia.....	20.00	28.00	26.00	24.25
Steel Billets, Chicago.....	28.00	28.00	25.00	24.00
Wire Rods, Pittsburgh.....	31.50	31.00	31.00	31.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago.....	14.50	14.00	15.50	11.50
O. Steel Rails, Philadelphia....	18.00	18.00	17.50	14.00
O. Iron Rails, Chicago.....	19.50	19.50	20.00	16.50
O. Iron Rails, Philadelphia.....	23.00	23.00	23.00	15.00
O. Car Wheels, Chicago.....	15.75	15.75	16.50	14.50
O. Car Wheels, Philadelphia....	16.00	16.00	16.00	13.00
Heavy Steel Scrap, Pittsburgh..	16.00	15.00	16.00	14.00
Heavy Steel Scrap, Chicago....	14.50	14.00	14.00	11.50

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia.	1.07½	1.73½	1.63½	1.43½
Common Iron Bars, Chicago....	1.60	1.60	1.65	1.45
Common Iron Bars, Pittsburgh..	1.65	1.65	1.65	1.34½
Steel Bars, Tidewater.....	1.64½	1.64½	1.54½	1.44½
Steel Bars, Pittsburgh.....	1.50	1.50	1.40	1.30
Tank Plates, Tidewater.....	1.74½	1.74½	1.64½	1.74½
Tank Plates, Pittsburgh.....	1.60	1.60	1.50	1.60
Beams, Tidewater.....	1.74½	1.74½	1.64½	1.74½
Beams, Pittsburgh.....	1.60	1.60	1.50	1.60
Angles, Tidewater.....	1.74½	1.74½	1.64½	1.74½
Angles, Pittsburgh.....	1.60	1.60	1.50	1.60
Skelp, Grooved Steel, Pittsburgh	1.65	1.60	1.50	1.45
Skelp, Sheared Steel, Pittsburgh.	1.70	1.65	1.55	1.50
Sheets, No. 27, Pittsburgh.....	2.20	2.20	2.20	2.20
Barb Wire, Pittsburgh.....	2.25	2.25	2.25	2.55
Wire Nails, Pittsburgh.....	1.80	1.80	1.80	1.95
Cut Nails, Pittsburgh.....	1.80	1.80	1.80	1.70

METALS:

Copper, New York.....	15.25	15.25	15.25	12.50
Spelter, St. Louis.....	6.15	6.10	6.00	4.80
Lead, New York.....	4.45	4.45	4.55	4.50
Lead, St. Louis.....	4.35	4.35	4.35	4.47½
Tin, New York.....	28.50	28.60	29.32½	28.00
Antimony, Hallett, New York...	7.87½	7.87½	8.50	7.00
Nickel, New York.....	38.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York.....	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, March 8, 1905.—(By Telegraph.)

A heavy buying movement has set in in Pig Iron, from the fact that most of the Southern and Northern producers have opened their books for orders for delivery the third and fourth quarters of the year. While it is impossible to gain accurate information thus early, appearances indicate that there has been more Iron booked the first week in March than during the whole month of February, although February was a fair month. There are still some furnaces that refuse to obligate themselves beyond July 1 at present prices, though there is no indication that any melter in the Chicago district has thus far been induced to pay more than current prices for second half delivery. Specifications on various lines of Finished Iron and Steel are reported to be highly satisfactory, particularly on Bars and Plates, and to a lesser extent on Pipe, Tubes and Structural Materials. The Sheet market is rallying, and already some independent mills are refusing to take business at prices commonly understood to be the official ones of the leading producer. This is not to be wondered at, because the increasing cost of Sheet Bars and the great difficulty in securing them at any price have placed independent mills in a position where they have to get higher prices for their product or close down altogether. Rails, both Standard and Light Sections, are active in the Chicago market, and prices on Track Supplies are considerably firmer, although not officially advanced. There is no relief in the Billet situation and users seem reconciled to pay the premiums asked, provided they can only get some sort of reasonably nearby delivery. Old Materials show a number of advances, and the impression prevails that the turning point has come and that from now on prices will move upward instead of downward. The demand for spot in Chicago is greater than the visible supply and

premiums are being paid for shipments that are on track here or are *en route*. Wire prices are firm, with another advance looked for. Metals are quiet, with prices ranging lower.

Pig Iron.—Several large houses state that their sales for the first week in March aggregated almost as large a tonnage as the entire month of February. A heavy buying movement has set in, largely for delivery during the last half of the year. One Chicago melter bought 4000 tons of Southern Iron for delivery over the balance of this year. South Bend and Mishawaka interests have bought fairly large tonnages, and implement makers and manufacturers generally throughout the States tributary to Chicago are coming into the market for liberal tonnages for delivery the third and fourth quarters of the year. Some furnaces are endeavoring to secure a premium of 25c. a ton for delivery beyond July 1, but as far as can be learned no contracts have been placed in this market on that basis, as there are important Southern producers who are willing to store Iron free of charge throughout the second half of the year, provided payment is made on or before July 1, and will sell at present prices on that basis, giving certificates which are bankable. The buying movement is about equally distributed between Northern and Southern Irons, and there is a feeling that prices may be advanced 50c. a ton before another week is out. We make no changes in our price-list, but in some instances there might be difficulty in securing Iron for delivery during the second half of the year at the minimum prices named. We quote:

Lake Superior Charcoal.....	\$18.50 to \$19.00
Northern Coke Foundry, No. 1.....	18.00
Northern Coke Foundry, No. 2.....	17.50
Northern Coke Foundry, No. 3.....	17.00
Northern Scotch, No. 1.....	18.00 to 18.50
Ohio Strong Softeners, No. 1.....	19.30 to 19.80
Ohio Strong Softeners, No. 2.....	18.80 to 19.30
Southern Silvery, 4 to 6 per cent. Silicon.....	18.65 to 19.65
Southern Coke, No. 1.....	17.65 to 17.90
Southern Coke, No. 2.....	17.15 to 17.40
Southern Coke, No. 3.....	16.65 to 16.90
Southern Coke, No. 4.....	16.40 to 16.65
Southern Coke, No. 1 Soft.....	17.65 to 17.90
Southern Coke, No. 2 Soft.....	17.15 to 17.40
Southern Gray Forge.....	16.50 to 16.75
Southern Mottled and White.....	15.90 to 16.15
Malleable Bessemer.....	17.50
Standard Bessemer.....	18.50 to 19.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon.....	20.30 to 22.30
Jackson County and Kentucky Silvery, 10 per cent. Silicon.....	23.30
Alabama Basic.....	17.65
Virginia Basic.....	17.65

Billets.—Bessemer Rolling Billets are quoted at from \$26 to \$28 a gross ton, Chicago, in car lots, while Open Hearth Forging Billets range from \$30 to \$32, Chicago. Beyond these base prices there are the usual extras for sizes larger than 100 square inches in section and smaller than 16 square inches.

Rails and Track Supplies.—The Illinois Steel Company booked orders during the month of February for more than 100,000 tons of Standard Section Rails and has entered since December 10 orders amounting to more than 500,000 tons. In other words, this mill has already new orders on hand which, together with specifications on old contracts, will keep its plant running full time to next November. Light Section Rails are improving in demand with every day of milder weather, and are now firm at \$24 to \$27 per gross ton at maker's mill in round lots, with higher prices charged for small lots. We quote Standard Section Rails in 500-ton lots and greater, \$28, at mill. Light Rails, f.o.b. Milwaukee mill, on about the following basis: 8 and 10 lb. Sections, \$28; 12-lb., \$27; 16-lb., \$26; 20 and 25 lb., \$25; 30 to 45 lb., \$24; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.70c. to 1.75c.; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—Several small buildings, ranging from 250 to 400 tons of Structural Steel, have been placed and several larger are still pending. Mills profess to be full of business and this claim is supported by the fact that it is becoming increasingly difficult to get prompt delivery. Prices are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices for either random lengths or cut to lengths on Angles, Beams and Channels, base sizes, range from 2c. to 2.10c., with the usual extras for size.

Plates.—Notwithstanding the fact that the leading Western Plate mill is so full of business that its deliveries range from 30 to 60 days, Eastern mills in this market are able to make very prompt shipment, in some cases executing and shipping orders within 48 hours after their receipt at mills. This advantage in delivery is giving Eastern mills a nice business in this market. Plate prices are unchanged, as follows: Tank quality, ¼-inch and

heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—The tone of the Sheet market is much stronger than last week and it is evident that the leading producer is declining to quote current prices for delivery during the last half of the year, as the independent mills are beginning to have business offered to them at official prices for second half delivery. This is particularly true in light gauges, which rule very low in proportion to the cost of Sheet Bars and labor. Inquiry is much more active than it has been and heavy tonnages are being booked. The Inland Steel Company expects now to open its Sheet mill in April, as all necessary repairs have been made and the plant is in readiness for operation. The following are the official minimum prices for car lots and greater at Chicago, delivered from mill: Blue Annealed Sheets, Nos. 9 and 10, 1.86½c.; Nos. 11 and 12, 1.91½c.; Nos. 13 and 14, 1.96½c.; Nos. 15 and 16, 2.06½c.; Box Annealed Sheets, Nos. 18 and 20, 2.21½c.; Nos. 22 and 24, 2.26½c.; Nos. 25 and 26, 2.31½c.; No. 27, 2.36½c.; No. 28, 2.46½c.; No. 29, 2.61½c.; No. 30, 2.71½c. Store prices rule as follows: Blue Annealed Sheets, No. 10, 2.05c. to 2.15c.; No. 12, 2.10c. to 2.20c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.25c. to 2.35c.; Box Annealed Sheets, Nos. 18 and 20, 2.45c. to 2.50c.; Nos. 22 and 24, 2.45c. to 2.55c.; No. 26, 2.50c. to 2.60c.; No. 27, 2.60c. to 2.70c.; No. 28, 2.70c. to 2.80c. Galvanized Sheets from mill are held quite firmly at the following minimum base prices, f.o.b. Chicago, in car lots: No. 16, 2.71½c.; Nos. 18 and 20, 2.86½c.; Nos. 22 and 24, 3.01½c.; No. 26, 3.21½c.; No. 27, 3.41½c.; No. 28, 3.61½c. These prices range from 75, 10 and 5 for No. 16 to 75, 10 and 10 for the heavier gauges. New prices quoted by local jobbers are as follows for small lots from store in base width: Nos. 10, 12 and 14, 3.10c. to 3.20c.; No. 16, 3c. to 3.10c.; Nos. 18 and 20, 3.10c. to 3.20c.; Nos. 22 and 24, 3.25c. to 3.35c.; No. 26, 3.50c. to 3.60c.; No. 27, 3.70c. to 3.80c.; No. 28, 3.95c. to 4.05c.; No. 29, 4.40c. to 4.50c.; No. 30, 4.85c. to 4.95c. Extras for width vary with the gauges.

Bars.—The advance in the price of Steel Bars and Bands noted last week affects only a minority of the consumers, as all the large users are covered with contracts at the old price, most of them at 1.30c., or \$4 a ton lower than present figures. Notwithstanding this fact the increment in consumptive demand has led to the purchase of larger quantities than were covered by contracts, and to this end new prices will bring added revenue to the Bar mills. Iron Bars are strong at 1.60c. to 1.65c., but because most Bar users are covered by Steel at lower prices the output of Iron Bars is extremely small. The minimum car lot prices on Steel products at Chicago for shipment from mill are as follows: Soft Steel Bars and Bands, 1.66½c., base, half extras, Bessemer or Open Hearth; Soft Steel Hoops, unchanged but strong at 1.71½c., full extras; Soft Steel Angles, Channels, Tees and Shapes belonging to the Bar class, 1.76½c., half extras. This brings Steel Bands up to within 5c. of the base price of Hoops and an early advance on Hoops is expected. The same advance has been made in store prices, Steel Bars and Bands being held at a minimum of 1.85c., base, half extras, and Steel Angles and Shapes, 1.95c., half extras, while Soft Steel Hoops are unchanged at 2.10c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Specifications are described as being exceptionally heavy and mills are fully employed in supplying customers' wants. The advance of March 1 on Shapes based on Bars has not greatly stimulated business, as the leading users of Merchant Steel are covered on contracts extending to July 1 at last summer's low basis. The new official prices, Chicago, in car lots, are as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.23½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—The demand for Pipe is described as being satisfactory, though mills are not so full of business but what they can give prompt service. Discounts, Chicago, in car lots are as follows:

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
¼ and ¾ inch.....	65.85	49.85	63.85	47.85
½ and ½ inch.....	69.85	57.85	67.85	55.85

¾ to 6 inches.....	73.85	63.85	72.85	62.35
7 to 12 inches.....	68.85	53.85	67.35	57.85
Extra strong pipe, ¾				
to ¾ inch.....	58.85	46.85	56.85	44.85
½ to 4 inches.....	65.85	53.85	63.85	57.85
4½ to 8 inches.....	61.85	49.85	59.85	47.85
Double extra strong,				
pipe, ½ to 8 inches.....	54.85	43.85	52.85	41.85

Boiler Tubes.—Boiler Tubes are in good demand, and prices are held so firmly that there is a feeling that another advance is not far in the future. The following are the official car lot discounts at Chicago:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	44.35	41.35	54.35
1½ to 2¼ inches.....	56.35	41.35	42.35
2½ inches.....	58.35	46.35	45.35
2¾ to 5 inches.....	64.35	53.35	up to 4 in.
6 to 13 inches.....	56.35	41.35	52.85

Discounts on less than car lots from mill are two points lower, equivalent to an average of \$4 a ton higher in price. While there is no unanimity or agreement between jobbers as to the discounts from store, the average for fairly large orders is based on the following discounts, f.o.b. warehouse:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2½ inches.....	52½	35	37½
2¾ to 5 inches.....	60	47½	47½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—The leading producer secured a contract for 500 tons of Pipe for Toledo, Ohio, on the basis of \$24, delivered, for 6, 8 and 12 inch sizes. Prices at Chicago rule as follows: \$28.50 a gross ton for 4-inch Water Pipe and \$27.50 for 6-inch and larger, with \$1 extra for Gas Pipe.

Old Materials.—From some unknown source a new element of strength is entering the market, though as far as can be learned none of the large buyers has come into evidence. The market for some reason seems to be rallying nicely from the long sinking spell which it has gone through. No lists of importance have been closed thus far, though the Santa Fé has a large tonnage which will be awarded tomorrow and the Wisconsin Central has a small list upon which no definite date of award is placed. The advances noted in the table below as compared with last week are largely on Steel materials, which had been ruling lower in proportion to their supposed value than Iron. Possibly the recent advance in Steel Bars has had something to do with the betterment in Steel Scrap. The following prices represent the range at which large consumers can buy their materials from railroads or from large dealers, per gross ton:

Old Iron Rails.....	\$19.50 to \$20.00
Old Steel Rails, 4 feet and over.....	15.50 to 16.00
Old Steel Rails, less than 4 feet.....	14.50 to 15.00
Heavy Relaying Rails, subject to inspection.....	22.50 to 23.00
Heavy Relaying Rails, for side tracks.....	20.00 to 20.50
Old Car Wheels.....	15.75 to 16.00
Heavy Melting Steel Scrap.....	14.50 to 15.00
Frogs, Switches and Guards.....	14.50 to 15.00
Mixed Steel.....	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates.....	\$17.50 to \$18.00
Iron Car Axles.....	21.00 to 21.50
Steel Car Axles.....	16.50 to 17.00
No. 1 Railroad Wrought.....	16.50 to 17.00
No. 2 Railroad Wrought.....	15.50 to 16.00
Shafting.....	16.50 to 17.00
No. 1 Dealers' Forge.....	12.50 to 13.00
Wrought Pipes and Flues.....	12.00 to 12.50
No. 1 Cut Busheling.....	11.50 to 12.00
Iron Axle Turnings.....	11.50 to 12.00
Soft Steel Axle Turnings.....	11.50 to 12.00
Machine Shop Turnings.....	11.00 to 11.50
Cast Borings.....	8.75 to 9.00
Mixed Borings, &c.....	8.75 to 9.00
No. 1 Mill.....	9.75 to 10.00
Country Sheet.....	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings.....	11.50 to 12.00
No. 1 Cast Scrap.....	13.50 to 14.00
Stove Plate and Light Cast Scrap.....	11.00 to 11.50
Railroad Malleable.....	13.50 to 14.00
Agricultural Malleable.....	12.50 to 13.00

Metals.—Trade in Metals is very light, with weaker prices on Pig Tin. Spelter is a little stronger. We quote: Copper is held at 15¼c. to 15½c. for Casting, and 15¾c. to 15¾c. for Lake, in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.45c., in car lots at 4.50c. and 5c. to 5¼c. in small lots; Pig Tin at 20¾c. to 30c. in car lots, and 30¼c. to 31c. in less than car lots. Spelter is in slow demand, the car lot price being 6¼c. and the small lot price 6½c. Sheet Zinc is held at \$7.50, base, La Salle, equivalent, after deducting discounts, to \$7.25, Chicago, for car lots of 600-lb. casks, with small lots selling at \$7.50 to \$8. Prices of Old Metals are as follows: Copper Wire, 13¼c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 12c.; Red Brass Borings, 10¾c.; Yellow Brass, Heavy, 9c.; Yellow Brass Borings, 7¾c.; Light Brass, 7¼c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4¼c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

Coke.—It is difficult to state a definite market price for Coke, as prices vary according to the necessities of the buyer and the ability of the seller to make delivery. Delivery, after

all, is the vital point. A buyer who wishes Coke for prompt delivery is likely to pay a basis of \$3.25 at the ovens for 72-hour Connellsville Coke, while sales are made at less than \$3 for Connellsville Foundry Coke where no urgency of delivery is involved. Some Cokes from portions of the Connellsville region are offered here as low as \$2.75 at the ovens. With this explanation we quote Connellsville Foundry Coke at \$3 at the ovens and Furnace Coke at \$2.50 to \$2.75, to which price \$2.65 freight should be added to make Chicago delivered price. Wise County, Va., Coke is not in much evidence now in this market, as it is understood that most of the stock is going to the Birmingham fields. It is offered, however, on a basis of \$5.40 to \$5.65, Chicago.

Cincinnati.

FIFTH AND MAIN STS., March 8, 1905.—(By Telegraph.)

Pig Iron.—The market during the week just closed has apparently shown a greater degree of activity than has developed at any like period of the year. Eastern buyers have been most liberal in their purchases and have been an important factor in maintaining the strength of the market. The buying has been confined principally to one or two of the large melting concerns and was, for the most part, for last half delivery. Moderate buying by smaller interests are reported, brought about in some instances by sales agents who confidently expect an advance in prices at an early date. Furnaces both North and South are generally said to be willing and ready to book business for the remainder of the year, such contracts, however, to be at an advance in prices. Basic Iron is reported strong, with some buying for last half. The jobbing foundry trade is quiet, and concerns of this class are merely buying from time to time enough tonnage to relieve their immediate needs. The leading Cast Iron Pipe interests have been heavy purchasers during the week. The report is that they secured about 9000 tons of the lower grades, principally for Southern delivery, at practically schedule prices. They are said to have a comparatively small tonnage on hand and are in the market for anything that may be an object. The large electric companies, Stove manufacturers and Steel Castings people are consuming immense quantities of Iron and at the present are among the heaviest buyers. The car shops are also exceedingly busy, but they are apparently covered for short delivery. Southern prices are slightly stronger and we learn of sales being made at \$13.75, Birmingham, basis for No. 2. Northern quotations are unchanged and are apparently firm at last week's quotations. We learn of one of the large electric concerns having purchased 20,000 tons, all Northern excepting 4000 tons, which was Virginia brands. This concern is also said to be in the market for about 12,000 tons of Northern make of Iron, contract for which will probably be let to-day. There is one inquiry for 1000 tons of Southern from a large Indianapolis plant. Aside from this the inquiries are general in themselves, of no considerable tonnage, but in the aggregate quite large. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$16.75 to \$17.00
Southern Coke, No. 2.....	16.25 to 16.50
Southern Coke, No. 3.....	15.75 to 16.00
Southern Coke, No. 4.....	15.50
Southern Coke, No. 1 Soft.....	16.75 to 17.00
Southern Coke, No. 2 Soft.....	16.25 to 16.50
Southern Coke, Gray Forge.....	15.25 to 15.50
Southern Coke, Mottled.....	14.75 to 15.00
Ohio Silvery, No. 1.....	20.65 to 21.15
Lake Superior Coke, No. 1.....	17.40 to 17.65
Lake Superior Coke, No. 2.....	16.90 to 17.15
Lake Superior Coke, No. 3.....	16.40 to 16.65

Car Wheel and Malleable Iron.

Standard Southern Car Wheel.....	\$18.50 to \$19.00
Lake Superior Car Wheel and Malleable.....	18.00 to 18.50

Coke.—The situation is reported easier, the supply is more plentiful and consumers have less difficulty in securing contract supply. Prices are unchanged, the best Foundry grades from Connellsville region selling from \$2.75 to \$3, f.o.b. ovens.

Plates and Bars.—The market is showing increased activity and demand is said to be increasing. With the weather in condition the Structural people expect heavy sales. Prices are unchanged, with the exception of Bar Steel, which was advanced by the association \$2 per ton. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in smaller lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; smaller lots, 2c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.73c., in carload lots.

Old Material.—Trade is fairly good and considerable tonnage is being handled. Prices, as far as we can learn, are unchanged. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$17 to \$18 per net ton; No. 1 Cast Scrap, \$14 to \$14.50 per net ton;

Iron Rails, \$21.50 to \$22 per gross ton; Steel Rails, rolling mill lengths, \$14.50 to \$15 per gross ton; Relaying Rails, 56-lb. and upward, \$23 per gross ton; Iron Axles, \$21 to \$22 per net ton; Car Wheels, \$16 to \$17 per gross ton; Heavy Melting Scrap, \$14.50 to \$15 per gross ton; Low Phosphorus Scrap, \$17 to \$18 per gross ton.

Cleveland.

CLEVELAND, OHIO, March 7, 1905.

Iron Ore.—The contract Ore rate on the movement down the lakes has been made for this year. Vessels and shippers got together on Saturday on the basis of 75c. from the head of the lakes, 70c. from Marquette and 60c. from Escanaba. On Saturday and Monday a big tonnage was covered for movement during the year on that basis. The rates as agreed upon for this year are 5c. higher from all ports than they were a year ago. The vesselmen are expecting an early opening of the season of navigation. The reports from the upper lakes are that the ice is on the average 10 inches thinner than it was this time a year ago, while clear water is seen 8 miles out of Duluth, whereas this time last year ice extended 25 miles out from the same point. The only thing which seems to indicate that there is likely to be a delay is the attitude of labor. The Lake Carriers' Association the past week abandoned its open shop policy, announced earlier in the year, and made contracts with all employees on shipboard with the exception of the masters and pilots. The masters have broken away from their union and have been instructed to hire their own mates or pilots with specific instructions that none of them shall belong to the union. The longshoremen, having admitted the pilots to affiliation, may take a stand that that union shall be recognized.

Pig Iron.—The market for Foundry Iron has in some places an appearance of strength, while the only real developments of the week have indicated an easier condition. Some of the furnaces in the Valleys are holding for \$16.50 in the Valleys for No. 2 Scotch and others are holding for the same for strong Foundry. In one or two instances the market has been even stronger, one furnace holding for \$17 for any delivery during the remainder of the year. These are isolated cases and do not represent the general tenor of the market. One or two good sales of No. 2 Foundry have been made at \$16, in the Valleys, for second half delivery, and the furnaces are of the opinion that further amounts could be covered at the same prices. The Southern producers are selling a little in this market at the present time at \$13.50, Birmingham, for immediate shipment. They have not sold much if any Iron here for second half delivery. The Basic trade is stronger. The furnaces generally are not disposed to sell for a longer period ahead than 60 days, believing that by that time the market will warrant higher prices. Some of the buyers, fearing a shortage of material in the next two months, are disposed to cover their needs for a longer period, but have not been able to do so. The quotation is \$15.50 in the Valleys. There is a good demand from smaller consumers for Bessemer at \$15.50 to \$16 in the Valleys. The Coke market is firm, with 72-hour Foundry Coke selling at \$3, at the oven, and Furnace Coke selling at \$2.50 to \$2.60, at the oven, with a supply adequate to all needs.

Finished Iron and Steel.—The advance in the price of Bar Steel has changed the local situation in both Bar Steel and Bar Iron considerably. Bessemer Bar Steel is now quoted 1.50c., Pittsburgh, while the old differential of \$2 on Open Hearth was restored, putting that price to 1.60c., Pittsburgh. The result was that the difference between Steel and Iron Bars was lessened, and turned some of the business on Bar Iron back into the normal channel from which it had been diverted. In addition the spring trade is opening now, and there is a better natural demand for Bar Iron, with the result that the market is ever so much stronger than it has been at any time for months. Some of the Bar Iron mills which have been running hand to mouth now have orders a little bit further ahead than their immediate needs. Prices are still strong at 1.65c. to 1.70c., Youngstown. The buying of Bar Steel has not been influenced to any extent by the rise in the price of that material. There is a good demand for Sheets, but the market has not changed in that respect. The spring buying has started in fairly well, but it has not reached its full proportions, probably because the Sheet mills are not disposed to make sales far ahead, anticipating another advance in a short time. In the Billet market the situation is especially strong, as it is in all of the semifinished material markets. The demand here for Bessemer and Open Hearth Billets is strong at a premium of about \$2 a ton over the association prices, Bessemer 4 x 4 bringing \$25 to \$26, Pittsburgh. The demand for Forging Billets is also strong. The Rail situation has not changed, the market being fairly firm and steady, but some of the projects upon which hope and reliance have been placed are not materializing as rapidly as it had been hoped for. In the Structural and Plate market it is still very largely a question of delivery, the mills hardly being in position to

take any great amount of new tonnage for the time being. The demand in Cleveland is increasing, however, for Shapes, and the market is strong on the basis of 1.60c., Pittsburgh.

Old Material.—The market for Scrap has been a little better during the past week. Some of the strength of the market at the present time comes from a little better buying of Scrap by the mills, which are getting better orders. The weak spots which appeared for the past few weeks have not been entirely cleared up, however, and the market is not buoyant in any way. The quotations are continued as they were a week ago, as follows, all gross tons: Old Steel Rails, \$16 to \$16.50; Old Iron Rails, \$23 to \$23.50; Old Car Wheels, \$17; Heavy Melting Steel, \$16 to \$17. All net tons: Cast Borings, \$9 to \$10; No. 1 Busheling, \$14 to \$15; No. 1 Railroad Wrought, \$17.50 to \$18; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$14.50 to \$15; Stove Plate, \$11 to \$12; Iron and Steel Turnings and Drillings, \$12 to \$12.50.

B. F. Harper, formerly special agent for the Carnegie Steel Company at Pittsburgh, Pa., will assist John R. Scott, manager of sales for the Cleveland district.

Philadelphia.

FORREST BUILDING, March 7, 1905.

The demand for Pig Iron continues on an unprecedented scale, although of late it has been of a more general character than during the two or three preceding weeks when Steel makers were the chief buyers. The foundry trade has taken a great deal of Iron during the past few days, and, like Oliver Twist, is asking for more. New England and districts outside the local territory are heavy buyers, so that there appears to be an almost unlimited demand for material. Buying on such a scale as during the past three or four weeks, however, cannot continue much longer, as consumers have bought practically all the Pig Iron they can use until the late fall months. It requires only a few minutes to buy tens of thousands of tons, but it requires weeks and in some cases months before it can be consumed. Naturally the tonnage contracted for is in proportion to the expected requirements, in which case 1905 will certainly be a phenomenal year. Nevertheless, it would be out of the question to expect the Pig Iron market to maintain its activity very much longer. The real tests have yet to be applied, not by buying or selling, but in producing and consuming. How much Pig Iron can be made and how much will be consumed will be the tests. It is believed that the capacity for production will be somewhat strained to meet the requirements of consumers, and the margin may be narrow enough to impart great sensitiveness to prices. If deliveries begin to drag, indicating the possibilities of a shortage of Iron, it would be difficult to restrain buyers from taking the bit in their teeth and making a runaway market. On the other hand, if furnaces begin to accumulate Iron, prices would be apt to lose all their firmness, and the tone of the market would change immediately. The outlook at this time is therefore extremely interesting. A very little increase in the demand, or a very slight decrease from the estimated production, would easily make a higher market, and either of these contingencies is by no means a remote possibility, although reverse conditions would of course make a lower market. But everything points to an enormous consumption, so that for the present very little attention is given to the possibility of unfavorable developments, and, as a matter of fact, there is little to be said in regard to such possibilities except that it is the unexpected that happens. The course of events during the past week seems to confirm expectations of a broader market, but prices are probably as high as they will go for a while. Transportation facilities will be better as the weather improves, and the output at furnaces and mills should be large enough to prevent scarcity of anything that is really needed for immediate consumption.

Pig Iron.—The activity that was met with during February can hardly be expected to continue during March, but there has been very little falling off so far. Nevertheless, the chief interest during the next two or three months will not be in the buying and selling, but in making deliveries of what has been bought. More than usual interest will be centered in that direction, as the ultimate course of prices will depend upon whether the uncovered requirements will be greater or smaller than the unsold surplus. This is a most important feature. Assuming that 15,000,000 tons of Pig Iron have been bought for delivery during 1905, the surplus cannot be much if anything over 700,000 tons per month, and if 750,000 tons or more be wanted prices must necessarily reach a higher level. Prices are regulated not by the great demand, but by a plus or a minus in the supply. At this stage of the proceedings it is impossible to say which of these it will be. It is well understood that the supply will be the greatest on record, and it is also believed that the demand will be the largest ever known, but the problem of surplus or the reverse time alone can determine. This month's furnace report may throw some light on the situation, but it may require several such reports before the

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situation is fully developed. Meanwhile, however, deliveries are rather slow and unless more open weather helps out a little prospects in that respect are not all that could be desired, although as yet there has been more scare than any real shortage. Imports of two or three cargoes of Iron are being made, but the product is for export, so that these shipments have no special significance, although in case of an advance of \$1 or so over to-day's prices foreign Iron could be brought in at a profit at some points. Meanwhile to-day's prices for city and nearby deliveries are about as follows:

No. 1 X Foundry.....	\$18.00 to \$18.25
No. 2 X Foundry.....	17.50 to 17.75
No. 2 Plain.....	17.00 to 17.25
Standard Gray Forge.....	16.00 to 16.50
Ordinary Gray Forge.....	15.50 to 15.75
Basic.....	16.75 to 17.00
Low Phosphorus.....	20.00 to 20.50

Ferromanganese.—There is considerable inquiry for this article, which is quoted at about \$43.50. Sales have been made at something below that figure, but the tone of the market is firm, and considerable business could be taken at around \$43, delivered, to nearby mills.

Steel.—The demand is very active, and plenty of business could be had at about \$28. Small lots and immediate shipments are held at \$29 to \$30, which needy buyers will probably have to meet.

Muck Bars.—The market is rather dull and sales hard to make unless at concessions. Asking prices are \$28.50 to \$28.75, f.o.b. seller's mill.

Plates.—Orders are numerous, and in the aggregate they reach a heavy tonnage, but no specially large lots have been on the market during the past week or two. Mills are turning out a large tonnage, however, although they still manage to keep their order books well filled. Prices unchanged as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide.....	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under.....	1.63½	1.68½
Flange or Boiler Steel.....	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.93½	1.98½
Still Bottom Steel.....	2.03½	2.08½
Locomotive Fire Box Steel.....	2.23½	2.28½
The above are base prices for ¼-inch and heavier. The following extras apply:		
3-16-inch thick.....	\$0.10	pounds extra.
Nos. 7 and 8, B. W. G.....	.15	"
No. 9 B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"

Structural Material.—The current demand is very satisfactory, mills being kept well employed on orders that come in from day to day. No new business of importance can be reported, but there is a heavy tonnage on the books, so that full employment seems to be fully assured for the spring and summer months. Prices are about as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—There is not as much inquiry as there was a few weeks ago, although the mills are well employed and are getting specifications with satisfactory promptness. At the prices which are now quoted buyers are inclined to defer further operations until they have absorbed some of their recent purchases. Steel Bars have been advanced a tenth, and are now quoted 1.63½c. to 1.68½c. Refined Bars are 1.67½c. to 1.80c., although some quote higher than the outside figure, while in other cases the inside may be shaded, according to quality, quantity and location of mill.

Sheets.—There is a heavy demand, and, although prices are about two-tenths higher, there is no falling off in sales.

Old Material.—The market is not active, but prices are stubbornly firm. Mills are beginning to need stock, but they are unwilling to pay the prices for which it is held, so that it is a stand off on both sides. Small lots of stuff can be picked up at inside prices, but no considerable tonnage can be had at less than the full asking rate. The situation is a very peculiar one, and unless a great deal more Scrap comes into the market than there is at the present time prices are liable to go materially higher. Prices are as follows for deliveries in buyers' yards:

Old Steel Rails.....	\$18.00 to \$18.25
No. 1 Steel Scrap.....	17.50 to 18.00
Old Steel Axles.....	20.00 to 21.00
Old Iron Axles.....	24.50 to 25.50
Old Iron Rails.....	24.00 to 24.50
Old Car Wheels.....	16.50 to 17.50
Choice Scrap, R. R. No. 1 Wrought.....	22.00 to 23.00
No. 1 Yard Scrap.....	19.50 to 20.50
Machinery Scrap.....	15.50 to 16.00
Low Phosphorus Scrap.....	20.50 to 21.50
Wrought Iron Pipe.....	16.50 to 17.00
No. 1 Forge Fire Scrap.....	16.50 to 17.00
No. 2 Forge Fire Scrap, Ordinary.....	12.00 to 13.00
Wrought Turnings.....	15.00 to 15.50
Axle Turnings, Choice Heavy.....	16.00 to 16.50
Cast Borings.....	11.25 to 11.50
Stove Plates.....	13.50 to 14.00

Pittsburgh.

PARK BUILDING, March 8, 1905.—(By Telegraph.)

Pig Iron.—While there is little inquiry for Bessemer or Basic, the market is quite firm on the basis of \$15.50, Valley furnace, or \$16.35, Pittsburgh. We note a sale of 3000 tons of Bessemer, equal deliveries, July, August and September, at that price. The Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company have closed for a part of the 14,000 tons of Pig Iron wanted by them, and the balance will likely be closed up to-day. The Southern Iron went on the basis of about \$13.50, Birmingham, for No. 2, and part of the Northern Iron at \$16, Valley furnace, for shipment to the Westinghouse Electric Works in Allegheny, Pa. Part of the Iron for the Cleveland Works of the Westinghouse Electric Company will probably be taken at a shade under \$16, at furnace, by two blast furnaces in the Cleveland district, who have a very low freight rate. There is some inquiry for Forge Iron for third quarter delivery, and while Northern Forge has been available recently as low as \$15, Valley furnace, or \$15.85, Pittsburgh, Valley furnaces now quote \$15.15, at furnace, or \$16, Pittsburgh.

Steel.—There is no abatement in the demand for Billets and Sheet and Tin Bars and the mills are still very much behind in delivery. The decision of the Youngstown Iron Sheet & Tube Company to build a Bessemer Steel plant at Youngstown is good news to a number of independent Sheet and Tin Plate mills, which will look to the new plant for their supply of Sheet and Tin Bars. However, this plant cannot be built within a year or longer. Sheet Bars in random lengths have sold recently at \$25.50, maker's mill, but the few outside sellers of Bars now quote \$26 at maker's mill for Sheet and Tin Bars in long lengths. Bessemer and Open Hearth Billets readily bring \$24 or higher for prompt delivery, while Forging Billets bring \$26 and upward, depending on carbons.

Coke.—In the past week there has been an active inquiry for Furnace Coke for second half of the year delivery, and it is said some contracts have already been made at a price slightly above \$2.25, at oven. Some Coke operators are not disposed to sell their Furnace Coke at less than \$2.50 a ton at oven for second half delivery, believing the prices will be higher for the last six months than they are now.

(By Mail.)

A distinct lull has been observed in all branches of the Iron trade in the past week, but this is probably due to the fact that consumers of Pig Iron, Steel and Finished Iron and Steel have bought heavily recently and are out of the market temporarily, having covered their wants for some time ahead. The weather of the past three or four weeks has been against trade, the heavy snows practically prohibiting any outdoor work, and this has restricted very much consumption of such materials as enter into building work. The mills have a very heavy tonnage on their books for nearly all lines of products, much of which was taken before the advances in prices were made, and specifications on these contracts are coming in at a fairly satisfactory rate.

Aside from the purchase of about 8000 tons of Foundry Pig Iron made last week by the Westinghouse Air Brake Company, and the inquiries of the Westinghouse Electric & Mfg. Company for 10,000 tons and the Westinghouse Machine Company for 4000 tons, the Pig Iron market has been rather quiet and no large inquiries are in hand. The Westinghouse Iron is being closed up to-day (Tuesday), on the basis of about \$13.50, Birmingham, for No. 2, and \$16, Valley, for Northern No. 2. The United States Steel Corporation may buy some March and April Iron, but as yet no negotiations have been started. The price of Bessemer and Basic Iron remains at \$15.50, Valley furnace, but there is more or less Iron in the hands of dealers, some of which has been sold as low as \$15.15, at furnace, and up to \$15.25. Northern No. 2 Foundry Iron is quite firm at \$16, and Northern Forge is held at about \$15.15, Valley, or \$16, Pittsburgh, but on some recent business placed this price has been slightly shaded.

The Steel market continues active, the mills being filled up for several months and are from two to four weeks behind in deliveries. Sheet Bars in random lengths have sold recently at \$25.50, maker's mill, but the market to-day is probably all of \$26, maker's mill.

The demand for Finished Iron and Steel has been rather quiet the past week, but with the return of good weather, permitting outside building operations, together with the opening up of spring trade, new tonnage will no doubt show a very material increase. The mills are well employed on contracts, on which buyers are specifying quite freely. Prices are unchanged with the exception that Steel Bands have been advanced to 1.50c. and Steel Hoops will be put up \$2 or \$3 a ton within a week or ten days.

Ferromanganese.—A fair amount of inquiry is in the market for Ferro and we quote English and domestic at \$44 to \$45, delivered, the price depending on size of the order.

Rods.—We note sales of about 400 tons of Chain Rods on the basis of \$34, Pittsburgh, but we understand some

sellers now quote \$35 and will not accept less. Bessemer and Open Hearth Rods are very quiet in demand and are held at \$31.50 to \$32, Pittsburgh.

Skelp.—There is a moderate inquiry and the mills are well filled up with tonnage. Sales of Acid Grooved Steel Skelp have been made recently at 1.65c., at mill. We quote Grooved Iron Skelp at 1.70c. to 1.75c., Sheared at 1.80c. to 1.85c., Grooved Steel Skelp, 1.65c. and Sheared 1.70c. to 1.75c. These prices are for ordinary widths and gauges and are f.o.b. maker's mill.

Muck Bar.—The market is very quiet and prices seem to be easier. We quote best grades made from all Pig Iron at \$28, Pittsburgh.

Steel Rails.—Some fair sized orders have been recently placed, but the tonnage so far entered by the mills for delivery this year, said to be nearly 1,400,000 tons, is regarded as only fairly satisfactory. We quote \$28 at mill for Standard Sections. Light Rails are quiet and prices are weaker. We quote at \$23 to \$25, depending on weight.

Structural Material.—The outlook for trade is regarded as very satisfactory and, while no important local work has been placed in the past week, several good sized jobs are about closed and will likely be given out this week. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x 1/4 inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3 1/2 inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—New tonnage has been quiet the past week, but the mills are filled up on contracts for the next two or three months, and in some cases for a longer period. Buyers are specifying on these contracts very freely. We quote: Tank Plate, 1/4-inch thick, 6 1/4 to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than 1/4-inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauges No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)...	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A B. M. A." and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of 1/4 of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—New tonnage is only fair, but the mills are very busy on contracts on which specifications are coming in quite freely. The trade still expects an advance in Black Sheets, but no announcement of this has yet been made. It is claimed that at present prices of Sheet Bars, which are selling at \$25.50 or higher, there is only a small profit to the mills rolling Sheets from these Bars. We quote: No. 24, box annealed, one pass through cold rolls, 2.05c.; No. 26, 2.15c.; No. 27, 2.20c., and No. 28, 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.23c.; No. 28, 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at \$2.95 for 2 1/2-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—New tonnage in both Iron and Steel Bars is rather light, large consumers having been given a chance to cover before prices were advanced and as a result are not placing new orders, but are specifying on these contracts. We quote Common Iron Bars at 1.65c. to 1.70c. and Refined Iron Bars, 1.75c. to 1.80c., f.o.b. Pittsburgh. We quote Bessemer and Open Hearth Steel Bars at 1.50c., base, in carloads and larger lots, with the usual advance for smaller lots.

Hoops and Bands.—Prices of Steel Bands have been advanced to 1.50c., base, half extras as per National Bar Steel card. Steel Hoops remain at 1.55c., but will likely be advanced \$2 or \$3 a ton within a week or ten days. There is very little new tonnage in either Hoops or Bands being placed, consumers being covered by contracts made when prices were lower than they are now.

Cotton Ties.—Within a week or ten days the mills rolling Cotton Ties are expected to announce prices for this season's delivery, which will probably be on the basis of 85c. per bundle for large lots, with the usual differentials for small lots.

Tin Plate.—The mills continue exceedingly busy on contracts, and a fair amount of new business is also being placed. The trade anticipate an early advance in the price of Tin Plate, and are willing to buy for delivery as far ahead as third quarter at present prices. We continue to quote 100-lb. Cokes at \$3.50 net, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

Merchant Pipe.—Daily press reports to the effect that the Philadelphia Company had placed an order with the National Tube Company for 150 miles of 10 and 16 inch Line Pipe are untrue. This business was placed some months ago, and the contract has been nearly filled. The report probably arose from the fact that the Philadelphia Company is in the market for about 2000 tons of oil well goods, which will likely be placed this week. The demand for oil country goods is very dull, but for Merchant sizes of Pipe is fairly active. No large gas or oil lines are in the market, with the possible exception of an oil line for California, which has been more or less talked about for some months, but with which nothing has been done. Discounts to consumers in carloads are as follows:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
1/4 and 1/2 inch.....	67 1/2	51 1/2	65 1/2	49 1/2
3/4 and 1 inch.....	71 1/2	59 1/2	69 1/2	57 1/2
1 1/4 to 6 inches.....	75 1/2	65 1/2	74	64
7 to 12 inches.....	70 1/2	55 1/2	60	53 1/2
Extra strong, plain ends,				
1/4 to 3/4 inch.....	60 1/2	48 1/2	58 1/2	46 1/2
1/2 to 4 inches.....	67 1/2	55 1/2	65 1/2	53 1/2
4 1/2 to 8 inches.....	63 1/2	51 1/2	61 1/2	49 1/2
Double extra strong, plain ends, 1/4 to 8 inches.....	56 1/2	45 1/2	54 1/2	43 1/2

Boiler Tubes.—The demand is quite active, railroads buying more liberally than for some time, especially Locomotive Tubes. Discounts in carloads are as follows:

	Iron.	Steel.
1 to 1 1/2 inches.....	43	46
1 1/2 to 2 1/4 inches.....	43	58
2 1/4 inches.....	48	60
2 1/2 to 5 inches.....	55	66
6 to 13 inches.....	43	58

Merchant Steel.—A fair amount of new tonnage is being placed, but the mills are very well filled up on contracts, and in one or two cases leading sellers are asking premiums for prompt delivery. The advance of \$2 on Steel Bars has carried a proportionate advance on some lines of Merchant Steels. The demand for Shafting is rather quiet, as consumers covered before the recent advance in prices. We quote: Tire Steel, 1.65c. to 1.75c.; Smooth Finished Machinery Steel, 1.75c. to 1.85c.; Open Hearth Spring Steel, extra quality, 2.25c. to 2.50c.; Tool Steel, ordinary grades, 5 1/4c. to 8c., extra grades 10c. and upward. We quote Cold Rolled Shafting at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues quite active and prices are firm. We quote \$1.65 to \$1.70 per 100 lbs. in carloads, and \$1.75 in less than carloads, f.o.b. car maker's mill.

Spelter.—Prices have again advanced and are liable to go higher. Prime Western Spelter sold last week as high as 6.07c. St. Louis, equal to 6.19 1/4c., Pittsburgh. We quote the market at this price.

Coke.—We can state officially that the report that the H. C. Frick Coke Company had secured the output of the Hecla Coke Company and several smaller concerns is untrue. Contrary to daily press reports, no negotiations were ever on between the Frick Coke Company and the Hecla Coke Company by which the former was to secure the output of the latter. The United Coal & Coke Company, controlled by the Frick Coke Company, is going steadily ahead with its operations in the Tug River district in Virginia. About 1200 Coke ovens have been finished and are in operation, and it is contemplated to build about 2000 more. While the car supply is better, it is not yet up to requirements and surplus Coke is piling up in the yards. Out of more than 29,000 ovens in the Upper and Lower Connellsville regions less than 1600 are idle, and some of these ovens will never again be operated, as the coal is exhausted. Strictly Connellsville Furnace Coke for prompt shipment brings \$2.25 to \$2.50 a ton at oven and 72-hour Foundry Coke about \$2.75 a ton at oven. Mainline or Main Line Furnace and Foundry Coke, which is made outside the Connellsville region, can be bought on the basis of \$2 or less for Furnace and about \$2.25 for Foundry.

Iron and Steel Scrap.—Prices of Heavy Melting Scrap have advanced, owing to the heavy demand, and while small lots can be picked up at \$16 to \$16.25, leading dealers are holding their Heavy Scrap for \$16.50. Other grades of Scrap are quoted as follows: Bundled Sheet Scrap, \$14.50;

No. 1 Wrought Scrap, \$19.50; Wrought Iron Turnings, \$13.50 to \$13.75; Cast Iron Borings, \$10.25 to \$10.50; Steel Rails, short pieces, \$15.75 to \$16; No. 1 Cast Scrap, \$15.25 to \$15.50; Iron Car Axles, \$22 to \$23, all in gross tons, f.o.b. Pittsburgh.

Birmingham.

BIRMINGHAM, ALA., March 4, 1905.

The Iron market was characterized last week as closing with a firmer tone and a hardening tendency. Its course the past week confirmed that diagnosis. An improved inquiry has been manifest, and actual concluded transactions were increased extending over a wider territory. Some important interests were in the market and took some Iron, but they did not take all they wanted; they took what they could get. Some of them waited too long and fought hard to get in, at first at \$13.50 and then at \$13.75, and ended in paying \$13.95 for a limited amount, basis of No. 2 Foundry. This was paid for 1000-ton lots, and the seller had accepted \$13.50 the preceding week. One order that got in early was filled on the basis of \$13.50 for No. 2 Foundry. But the demand was so keen at this price that there was but little opposition to the advance asked, and \$13.50 soon became a back number, and \$13.75 was only a resting place for a breathing spell. The market went without a halt to \$14, and it is now held at that point, with sellers asserting that they can obtain that price. Some sales ran into the second half, but they are avoided whenever possible. A sale of 1000 tons of No. 1 Foundry was made at \$14.45, a portion of it in delivery covering the third quarter.

Uniformity in values more nearly prevails now than has been the case for some time, but there are still some irregularities in the differences between grades. Every single interest considers the situation as strong and \$15 is common talk.

As an instance of the demand that has existed, the Sloss-Sheffield Company reports that its sales for the month just ended footed up 60,000 tons, and it is selling so far this month fully its make, if not more. The amount it had in reserve it has been compelled to deplete to accommodate the demands of its regular trade. Its surplus was the only one of consequence carried by any interest here. Just a little more trenching on it and it will entirely disappear and with it stock unsold will be "nil."

The Chattanooga Furnace Company has been purchased by C. E. Buek (president of the Trussville Furnace Company) and his associates, and the name will be changed to the Chattanooga Blast Furnace Company. When renovated by the present owners it will have a capacity of 150 tons per day, and will obtain supplies of raw material from properties controlled and owned by the new owners. But it will take until the coming July to put it in condition to earn any money for them.

The situation in Coal and Coke is improving very slowly. There is practically no relief as yet that eases up the conditions. A continuous improvement of the weather must go hand in hand with other conditions to restore affairs to their normal state. We can only repeat previous quotations and call them nominal. There would be no difficulty to obtain \$4 for Coke on prompt delivery.

The stockholders of the Dimmick Pipe Works at a meeting held the past week authorized the increase of its capital to \$500,000 and re-elected the old officers. Should circumstances warrant the capital will be increased to \$1,000,000, provision having been made to that end. The company reports a picking up of business of late and says the project is fine for all the offerings it will be able to handle. It quotes 4 to 6 inch Pipe at \$25 and \$24 for the larger sizes.

The United States Cast Iron Pipe Company, as previously indicated, is on the eve of important improvements at its Bessemer plant, which, when completed, will cost \$250,000. The plans are all completed and bids for the work are now being received.

The Birmingham Stove & Foundry Company was incorporated the past week and capitalized at \$25,000. It will succeed to the business of the Mauss plant. J. B. Gibson is president, H. D. Mauss is vice-president, and J. M. Jolley is treasurer.

As indicated some time ago, it can now be announced that oil has been struck in Baldwin County, south of Mobile. After boring to about 1600 feet the evidences were overwhelming of the presence of the oil sands, and letters from experts in charge on the ground are emphatic as to the prospects for a strike of great value.

The Allegheny Steel & Iron Company, Farmers Bank Building, Pittsburgh, with works at Avenue, Pa., has just completed the installation of a 35-ton old open hearth furnace, built by the S. R. Smythe Company, Pittsburgh. This plant now contains two 50-ton basic open hearth furnaces and a 45-ton acid open hearth furnace, giving it a daily output of about 300 tons of acid

and open hearth ingots. The company has also installed a light plate mill, which will roll up to 72 inches wide, but which will be used for turning out heavy sheets from 10 to 16 inch gauge. The mill was installed by the Mesta Machine Company, Pittsburgh, and is driven by a 36 x 60 inch Mesta engine. The greater part of the tables and shears for this mill were installed by the United Engineering & Foundry Company, Pittsburgh. It is also the intention to roll skelp on this new mill, the greater part of the output to go to the Reliance Tube Company, Pittsburgh, whose new tube mill is located at Breckenridge, Pa.

The Empire Steel & Iron Company.

The annual report of this company, submitted to the stockholders at the annual meeting, held in New York February 22, shows the following result of business for the 12 months ending December 31, 1904:

Total net earnings from operations.....	\$135,199.99
Reductions:	
Allowance for improvements and permanent repairs, included in costs.....	\$31,238.03
Depreciation mining properties.....	15,807.80
	47,045.83
Total net profit for year.....	\$88,154.16
Less dividends on preferred stock.....	75,000.00
Balance carried to profit and loss.....	\$13,154.16
Balance profit and loss account January 1, 1904.....	\$165,443.93
Added December 31, 1904.....	13,154.16
Balance carried forward January 1, 1905.....	\$178,598.09

President Leonard Peckitt's report is as follows: The production of pig iron was 163,202 gross tons, or \$2,311 tons less than the output of the furnaces for 1903. We mined and shipped during the year 111,375 tons of ore from Oxford and Mount Hope properties in New Jersey, and although the tonnage was somewhat larger (3500 tons) than the previous year, the output could have been considerably increased. Unfortunately, however, the iron market from the beginning of the year until well into the autumn months was far from active, so that several of the furnaces were closed down, thereby necessitating a further restriction of output at the ore mines.

The two Reading furnaces and the Topton plant were started early in September, and Macungie is ready to resume again just as soon as the necessary materials can be assembled. Owing to the depression improvement work during the entire year was, of course, restricted, although the idle furnaces were relined and repaired in a general way.

At Catasauqua the wooden bridges crossing the Lehigh River and Canal having been condemned as unsafe for the present railroad equipment were replaced by steel girders at a cost of close to \$30,000, and new boilers were erected at Reading, Oxford and Mount Hope.

The balance sheet taken from the books at the close of business December 31, 1904, shows:

Assets.	
Real estate, plants and machinery.....	\$2,788,646.51
Stocks and bonds.....	2,100,502.00
Cash in bank.....	\$130,849.42
Accounts receivable.....	148,777.09
Inventories: Pig iron.....	54,080.52
Raw material, supplies, &c.....	101,645.02
	435,352.05
Total.....	\$5,324,500.56
Liabilities.	
Capital stock, preferred.....	\$2,500,000.00
Common.....	2,281,400.00
	\$4,781,400.00
Bills payable.....	\$193,510.40
Accounts payable and pay rolls.....	115,628.82
Dividend payable January 2, 1905.....	37,500.00
Fund for depreciation and bad debts.....	17,862.25
	364,502.47
Profit and loss.....	178,598.09
Total.....	\$5,324,500.56

The treasurer in his statement reports: "There was set aside out of the cost of pig iron and ore a fund for extraordinary repairs and renewals on the operation of the Crane Furnaces as well as the different Empire plants. This fund combining all operations amounted to more than the expenditures that were made during the year for improvements, mine development, repairs and renewals. No losses were sustained during the year on

account of bad debts, and the company's record was maintained in the prompt payment of all accounts contracted, the year being closed with no past due audited accounts unsettled."

Having shown through a most discouraging year earnings sufficient to set aside over \$47,000 for improvements and betterments and \$75,000 for dividends, the report as a whole may perhaps be considered as entirely satisfactory and the outlook for the present year is highly encouraging.

The following were elected to serve for the ensuing year: Directors—Leonard Peckitt, Mark T. Cox, Charles H. Zehnder, Frank M. Jeffery, Elverton R. Chapman, Junius S. Morgan, James W. Fuller, Arthur A. Fowler, Anderson Fowler. Officers—President, Leonard Peckitt; vice-president, Charles H. Zehnder; secretary and treasurer, J. S. Stillman.

Natural Gas for Gas Engines.

Some interesting figures concerning the cost of fuel to operate gas engines are printed in the *Gas Engine* for January. The article states that it is usually considered that with gasoline a gallon per horse-power per 10 hours is sufficient, or with natural gas 15 cubic feet per horse-power per hour, or with artificial gas 20 to 22 cubic feet per horse-power per hour. These figures apply to engines running at full load, a gradual increase in consumption per horse-power resulting if the load decreases below the full normal load.

The figures given in the accompanying table were obtained from engines which were not run by experts and it is not known exactly what power they were developing, for they are rated at the power at which they

that under ordinary cases there should be a much less fuel bill than would be indicated by the maximum amount which the engine makers are willing to guarantee. In this case 57 engines, aggregating 1664 horsepower, are considered and the average among them should be worthy of consideration.

Underwriting: Its Types and Methods.

In the *Annals of the American Academy*, George Stevenson of Sailer & Stevenson, Philadelphia, discusses the developments of underwriting in an article which is in part as follows:

There are, roughly, two classes of underwriters. First, there are those who simply insure the successful issue of a security by some other person, and, second, there are those who agree themselves to take the security.

A practical illustration of the first kind is the case of the Pennsylvania Railroad Company, which in 1902 needed considerable money and proposed to issue \$75,000,000 stock at 120, requiring payment of some \$90,000,000. It would not do for the plan to fail. The company had spent the money and must recoup its treasury. A failure by the Pennsylvania Railroad could almost be regarded as a national failure. Therefore bankers were asked what they would charge to insure the success of the issue. The bankers formed a syndicate or combination, which differs from a corporation in that while the latter exists forever the syndicate ends when the transaction is over.

The gentleman making the contract with the Pennsylvania Railroad went back to New York and took out of his records a list which he has formed by years of ex-

	A.	B.	C.	D.	E.	F.	G.	Total.
Horse-power of engine, inclusive.....	6 to 10	12 to 20	22 to 30	35 to 40	45 to 50	60	80	
Number of engine.....	14*	7†	13‡	12‡	6	3	2	51
Total horse-power.....	114	116	344	455	295	180	160	1,664
Total hours run, per day.....	94	52	130	103	62	26	20	487
Total cost for gas, per month.....	\$46.50	\$30.75	\$181.00	\$188.90	\$132.25	\$63.25	\$66.00	\$708.75
Average horse-power.....	8.14	16.57	26.45	37.91	49.16	60	80	29.2
Average hours per day.....	6.7	7.4	10	8.6	10.3	8.7	10	8.56
Average monthly cost per horse-power.....	40.79c.	26.50c.	52.61c.	41.52c.	44.86c.	35.14c.	11.25c.	42.6c.

* One engine ran but one hour per day and two but two hours.
† One engine ran but two hours per day and one but four hours.

‡ One engine ran but five hours per day.
§ One engine ran but two hours and one but 1.5 hours.

are sold. It is not known precisely how many hours each day each one operated, but this is known very closely, as it was known in each case what the working hours of each plant were. It is not claimed that the figures are any indication of what may be done under expert service, but that they are the actual figures secured from engines installed and running under ordinary conditions. The engines were all of the four-cycle type, governing on the hit and miss plan. Natural gas, costing 25 cents per 1000 cubic feet, was used for fuel.

These figures show a cost per horse-power per month so low that no engine manufacturer would guarantee them. Assume a guaranteed fuel consumption of not to exceed 15 cubic feet of natural gas per horse-power per hour. This would mean 150 cubic feet per day of 10 hours, or 3900 cubic feet per horse-power per month of 26 days. At 25 cents per 1000 cubic feet this would mean 97.5 cents per horse-power per month, which is the guaranteed maximum rate of full load.

The figures in the table show about half this guaranteed maximum rate. We must assume that the figures are correct, for the engine manufacturer, as well as the users of the engines, stands back of them. The low cost must therefore be due to the fact that the engines were running on less than full load, which is as it should be.

But there was considerable difference between the various engines of the same size. For instance, one 40-horse-power engine cost \$13.50, another \$20 and another \$30, while one of the 80-horse-power cost \$30 and the other \$36. This was largely due no doubt to the difference in actual load carried by the engines, for each of those just mentioned ran 10 hours per day.

The value of these figures lies not in their statement of actual costs in any individual case, but in showing

experience and which is virtually a "roll of honor." It comprises a list of gentlemen who his experience tells him are financially able to float the security, whose word is as good as their bond. The process then followed is this:

The banker makes a succinct account of what his terms are and what he is committing himself to do. He sends this by cable to bankers in London, Berlin, Amsterdam, Paris and other European centers, with the request that they send him word in the morning how much they want to take. He sends a similar request to Philadelphia, Boston and Baltimore and other near by cities. He takes a list of the subscriptions and adds them up, and then makes an allotment according to his own ideas. All syndicate members are then sent an extended statement covering all points of the case, which they sign. These syndicate agreements are founded on honor, and confidence is indispensable. The document is sent back to the syndicate manager, who has plenipotentiary power to do almost as he sees fit within certain lines. For a small commission these bankers have agreed to pay out \$90,000,000 on the Pennsylvania stock issue within a short period, no matter what events arise meanwhile to interfere with the money market. That is a service worth speaking of. Of course individual banking houses are careful not to subscribe more than they can take care of in case of trouble. Those who promote the syndicate receive a large commission for originating and managing it.

The second kind of underwriting syndicate may be formed when a corporation wants to sell \$30,000,000 or \$60,000,000 of bonds. The president will ask a banker to underwrite the loan. The banker must be satisfied of the company's credit, of the correctness of statements

made him, and that it is a loan such as the market will take. He makes his terms and contracts to pay for that \$30,000,000 loan at a certain time. He also forms a syndicate, and if the loan is not sold before an agreed time the underwriters must pay the money; that is their risk. If the issue is successful the members will get checks for their profits from the promoter, and the syndicate is closed out, but no statements are rendered or expected. Bonds are usually marketed by the syndicate managers. There are generally one or two firms responsible for marketing the bonds, and the underwriters do not have to take the bonds unless these firms are unsuccessful. Not all syndicates are successful, and sometimes losses must be paid and syndicates are not closed up for years. The bonds become "stale" and difficult to sell.

The value of the service of the underwriting syndicate can scarcely be overestimated. Without it the floating of large issues would be almost impossible. The knowledge that a group of bankers stand ready to take the new issue themselves if they can't dispose of it on reasonable terms gives confidence to every investor.

New York.

NEW YORK, March 8, 1905.

Pig Iron.—There has been a good deal of activity during the past week, both in this market and in New England, in moderate sized lots of Foundry Iron for prompt delivery. In some instances in the New England territory Buffalo makers have had some advantage. There have also been some sales in New England of Basic Pig, one Steel plant taking a lot of 3000 tons. We quote: Northern Iron, tidewater, \$18 to \$18.25 for No. 1 Foundry, \$17.50 to \$17.75 for No. 2 Foundry, \$17 to \$17.25 for No. 2 Plain and \$16 to \$16.50 for Gray Forge. Alabama and Tennessee Irons are quoted \$17.50 to \$17.75 for No. 1 Foundry and \$17.25 to \$17.50 for No. 2 Foundry.

Cast Iron Pipe.—Inquiries have improved to some extent, owing to the nearer approach of spring, but so far no large lettings are in sight. Prices are firmly maintained on the basis of \$26.50 for 6 to 8 inch Pipe in carload lots at tide-water.

Finished Iron and Steel.—A new feature of the Structural trade is the appearance of a considerable number of inquiries for Steel buildings to be used for manufacturing purposes. It is definitely known that about 22,000 tons of desirable character will shortly be in the market coming from enterprises of this character, and judging from reports of manufacturing activity in all sections of the country a great deal more of this class of work is to be expected. The railroad field shows continued inquiry, and undoubtedly business will develop in this direction. Not much tonnage has been placed during the week, the most important being a contract for 2500 tons received by the leading bridge interest from the Indiana Harbor Railroad, Indiana. Additions have been received to several contracts previously placed by important railroad companies. Some very large propositions are being discussed which will run up to heavy tonnages if the projectors succeed in making their arrangements, but considerable financing is required. The building trade, so far as the use of Structural Steel is concerned, is very quiet, particularly around this city. It has always been observed, however, that after matters have been quiet for such a long period as has recently been the case the flood gates open and a great rush of business comes. This is what experienced men in the trade are rather confidently expecting to happen. The general demand for Finished Iron and Steel is fair, with no particularly heavy contracts being placed at the present time. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04½c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.74½c. to 1.84½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—The market has been active, particularly in Steel Scrap and Cast Scrap. Some of the leading dealers report the heaviest volume of sales since December. Transactions are known of over 8000 tons, comprising a large block of Steel Scrap, a round lot of City No. 1 Wrought Scrap, 2000 tons of Heavy Cast Scrap, 1000 tons of Stove Plate and a good quantity of Pipe Scrap. Inquiries are still in the market for Heavy Steel Scrap. The sales which have been made are reported to have been negotiated at full prices. The activity of the week has effected a large clearing out of stock in the local market, and if the railroad companies do not come in with too great offerings, as a result of the usual spring clearing up, it is likely that prices may

reach a higher level. Quotations per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails.....	\$22.00 to \$22.50
Old Steel Rails, rerolling lengths.....	16.50 to 17.50
Old Steel Rails, short pieces.....	16.00 to 17.00
Relaying Rails.....	20.00 to 21.00
Old Car Wheels.....	17.50 to 18.50
Old Iron Car Axles.....	22.00 to 23.00
Old Steel Car Axles.....	19.00 to 20.00
Heavy Melting Steel Scrap.....	16.00 to 17.00
No. 1 Railroad Wrought Scrap.....	20.50 to 21.00
No. 1 Yard Wrought Scrap.....	18.50 to 19.00
Iron Track Scrap.....	18.00 to 18.50
Wrought Pipe.....	14.50 to 15.50
Ordinary Light Iron.....	11.00 to 12.00
Cast Borings.....	9.00 to 10.00
Wrought Turnings.....	12.50 to 13.50
No. 1 Machinery Cast.....	16.00 to 17.00
Stove Plate.....	13.50 to 14.50

Metal Market.

NEW YORK, March 8, 1905.

Pig Tin.—Although the London market advanced almost £1 on the strength of an announcement to the effect that the amount of metal to be sold at the periodical Banca sales would be reduced by about 350 tons each sale this year, this market failed to respond to the advance; but, on the other hand, shows a slight decline as compared with the figures of last week. In fact, the quotations named here today are below parity with the London prices. This condition is accounted for by the fact that supplies here are now ample and actually in excess of the requirements of consumers. Tin is arriving at this port in comparatively large quantities, and during the months of January and February large shipments were made to consumers, who are now well supplied. At this writing spot and March delivery Tin is quoted 28.50c. to 29c. April delivery brings 28.37½c. to 28.87½c. and May Tin commands from 28.25c. to 28.75c. The London market quotes spot at £133 5s. and futures at £132. The arrivals so far this month amount to 1755 tons, and about 3050 tons are afloat. The next Banca sale will be held in Rotterdam on the 29th inst., when 1600 tons will be placed on auction.

Copper.—Business is extremely dull and prices remain nominally unchanged. Lake is quoted 15.25c. to 15.37½c.; Electrolytic, 15.12½c. to 15.25c., and Casting Copper, 14.87½c. to 15c. London has declined a shade, spot being quoted to-day £68 3s. 6d.; futures, £68 11s. 3d., and Best Selected, £72. So far this month the exports aggregate 5081 tons.

Pig Lead.—The market is quiet and unchanged. Spot stocks in this city are obtainable at 4.50c. to 4.60c. The American Smelting & Refining Company continues to quote on a basis of 4.45c. for Desilverized in 50-ton lots, 30 days shipment. St. Louis is unchanged at 4.35c., as is London at £12 5s.

Spelter.—The movement looking toward higher prices which has been launched in the West met with no success this week in this market, where prices remain unchanged. Spot Spelter can be had here at 6.10c. and stocks are said to be ample. St. Louis quotes 6.15c., however, and the London market has declined to £24.

Antimony.—The market is very dull and easy. Hallett's is quoted at figures ranging from 7½c. to 8½c. Cookson's is quoted 7.87½c. to 8.12½c. Other grades are from 7c. to 7.62½c.

Quicksilver.—The market is slightly lower, flasks of 75 lbs. being quoted at \$38. The London market is quoted at £7 12s. 6d.

Nickel.—The tone of the market is quiet and prices are practically without change, large lots being quoted at 40c. to 45c. and smaller quantities at 50c. to 60c.

Tin Plate.—The situation remains much the same as last week. Prices are firmly held, the American Sheet & Tin Plate Company quoting on a basis of \$3.74 a box for 14 x 20 100-lb. Coke Plates, f.o.b. New York, or \$3.55, f.o.b. Pittsburgh.

Brazil has plans for entering the field of naval construction to a much greater extent than has any South American power, if the bill passed on December 6 by the Senate becomes an act. The plans call for the construction of six battle ships of 13,000 tons each, to resemble in general characteristics the English battle ship *Triumph* of 11,800 tons, which is, in many respects, one of the most powerful afloat. In addition there are three armored cruisers of 9500 tons each, after the design of the Russian *Bayan*; six torpedo boat destroyers of 400 tons, six torpedo boats of 300 tons and six of 50 tons, three submarines and one 6000-ton transport. It has not yet been announced where these ships are to be built and armed, but it is more than likely to be in England.

The Southern Iron Merger Checked.

President J. C. Maben of the Sloss-Sheffield Steel & Iron Company has announced that so far as his company is concerned the proposed merger is off. He admits, however, that matters are in a shape to permit the renewal of negotiations at any time, and he further states that the Hoadley interests were entirely honest in their efforts to bring about the consolidation of the Southern iron properties, but that they were met with unexpected counter currents which it will take some little time to overcome before their entire plan can be carried out. In the meantime the Sloss-Sheffield interests refuse to be longer held in leash and say that any further negotiations in regard to the matter with them must be on a new basis.

President Maben and the other Southern stockholders of the Sloss-Sheffield Company who have been in town for two weeks waiting to close up their part of the deal, will now return to the South, and will proceed with the manufacture of iron and steel as heretofore and with the enlargement and improvement of their property. Preliminary to the departure of the officials the Executive Committee recommended an initial semiannual dividend of 2½ per cent. on the common stock and the usual quarterly dividend of 1¼ per cent. on the preferred stock, both payable April 3. This action no doubt will be formally ratified by the full Board of Directors in the near future.

It is stated that the special difficulty encountered was to secure control of the Tennessee Coal, Iron & Railroad Company. Even if the promoters of the merger had in their possession a majority of the company's stock, they could not displace the present Board of Directors until the annual meeting in May.

Iron and Industrial Stocks.

NEW YORK, March 8, 1905.

With the exception of the shares of the Southern iron companies, the market for iron and steel stocks has been fairly firm with moderate fluctuations. The promoters of the proposed Southern merger admit that difficulties have been encountered which cannot at this time be overcome. The project is, therefore, to be regarded as shelved for the present, but it may be taken up again when conditions are more favorable. Sloss-Sheffield common, which sold as high as 108 on Thursday of last week, declined to 83½ on Monday of this week, rising subsequently to 86 on Tuesday. Tennessee Coal similarly declined from 94½ to 87, and subsequently advanced to 89¼. Republic preferred declined from 79 to 76, recovering to 76¾. Last transactions on active stocks up to 1.30 to-day were made at the following prices: Can common 11¾, preferred 67½; Car & Foundry common 35, preferred 94½; Locomotive common 42¾, preferred 111½; Steel Foundries common 16¾, preferred 62; Colorado Fuel, 51; Pressed Steel common 36, preferred 87¾; Railway Spring common 34½, preferred 97; Republic common 18½, preferred 76; Sloss-Sheffield common 91¾, preferred 125; Tennessee Coal, 87½; United States Steel common 35¾, preferred 95¾; new 5's, 94¾.

Affairs in the New York building trade are on a much better basis than for a long time. Chairman Lewis Harding of the Press Committee of the Employers' Association says: "At no time since I can remember has there been so little friction in the building industry of New York as now or better prospects for industrial peace. The statistics before our association was formed show that there had been an average of 4000 building strikes yearly, the greater number being against contractors who are members of our body. At present there are no strikes of any consequence. Before we made the fight for the arbitration agreement no contractor could fairly figure on a contract. We have arranged now that the annual trade agreements shall begin on January 1, instead of May 1, so that when the building season begins the contractors can base their estimates on the wages they know they will be paying."

Emma Furnace of the American Steel & Wire Company at Cleveland has been blown in.

Electrical Equipment for Utah Copper Mines.

The Mammoth Copper Mining Company of Salt Lake City has just placed an order with the Westinghouse Electric & Mfg. Company for a large addition to its electrical equipment. A total of nearly 800 horse-power in induction motors of different sizes, together with a motor generator set, transformers, switchboard and three mining locomotives, is included in the order. The motors, two of which have a rated capacity of 200 horse-power each, and five of 50 horse-power each, will operate on three-phase 2000-volt circuits. This order is indicative of the progress being made in the field of electrical machinery in mining operations.

New York Pig Iron Warrant Market.

In view of the impending changes in the form of certificates, which will tend to facilitate the covering of contracts for specific grades of iron, the market for Pig Iron Warrant certificates on the New York Produce Exchange was firmer and displayed considerably more activity. During the week transactions were made aggregating 1700 tons, of which there were 200 tons March, \$16.65, and 500 tons March, \$16.75; 100 tons April, \$16.70, and 100 tons April, \$16.70; 800 tons May, \$16.80. The following quotations were established on call Wednesday:

	Bid.	Asked.
Cash	\$17.00
March	\$16.60	16.70
April	16.75	16.80
May	16.75	16.80
June	16.75	17.00
July	16.65	17.00

The American Steel and Wire Company.—The announcement is made that the American Steel & Wire Company, one of the constituent companies of the United States Steel Corporation, has expended for construction, improvement and repairs during the past three calendar years the total sum of \$15,378,296.06.

The failure in France of a cast iron steam valve has given rise to a discussion as to the cause. It appears that the valve was situated about 1 foot below the top of a 6.3-inch vertical pipe, which was joined at the upper end into the main 12-inch steam pipe. The main pipe was provided with the usual drain cocks, but there was a space above the valve large enough to contain about 1.5 gallons of water. At the time of the rupture the valve was being very gradually opened, after having been closed for eight hours. In spite of the precautions taken to let the water drain through, however, the valve burst. The explanation was given that the failure was due to the rapid liberation of energy, due to the rapid expansion allowed by the opening of the valve.

The English Board of Trade has recently issued an interesting document comparing the naval expenditures of the Powers with the tonnage of their overseas mercantile marines. Owing to the fact that the merchant marine of the United States is in such a deplorable position we need express no surprise at finding that our expenditure, on this basis, is the greatest of them all. The results are:

	Naval expenditure.	Mercantile marine.	Cost per ton.
Great Britain	\$170,500,000	\$11,617,469	\$15.18
United States	81,900,000	888,776	92.46
Germany	49,900,000	2,203,804	22.64
France	61,000,000	1,217,614	50.11
Russia	60,100,000	678,594	88.57
Japan	11,460,000	979,423	11.73

The Guggenheim Exploration Company is to pass under the control of the American Smelting & Refining Company. Heretofore the two companies were operated entirely independently of each other, although controlled largely by the same interests. The Guggenheim Company has been essentially a mining concern, while the smelting company has operated smelters and refineries solely, more especially for the precious metals, throughout this country and Mexico.

The Machinery Trade.

NEW YORK, March 8, 1905.

General conditions remain about the same as noted last week. Orders are being received in good volume in the principal lines of the trade and inquiries are steadily increasing in number. Evidences of the plans of large corporations along the lines of plant extensions mapped out for the year are beginning to show in the trade and forecast heavy machinery purchases. In fact, the inquiries received during the last week or two show some of these projects to be beyond the preliminary stages. The United States Steel Corporation and several other large companies, including the principal electrical machinery manufacturers, are now placing substantial orders, which are said to be but forerunners of much larger business which is to follow. The influence of the increased demand for iron and steel and other raw materials is being felt somewhat in the machinery trade. While there is a slight amount of price cutting being indulged in by machinery merchants on certain standard lines of machinery, values on the whole can be said to be holding up very firmly. From the Pittsburgh district there comes talk of pending advances in prices on certain smaller lines which are meeting with a very heavy demand. Builders of high-class machinery who have become known in the trade as "one price" houses seem to be experiencing no difficulty over the matter of prices and say that they are losing no business through any cutting that may be going on.

As to the machine tool market, we hear that certain well-known concerns making gear cutting machinery, shapers and drill presses are quoting from 12 to 16 weeks' delivery. Milling machines are also very firm and the makers of special lathes designed to operate with the high speed tool steels are enjoying a brisk demand.

Referring to high speed tool steels leads to comment upon a state of affairs brought about in the heavy tool line by their introduction. It seems that the builders of the heavy types of machine tools must now carry a double line—one for the high duty work and one for using the ordinary tool steels at a comparatively moderate rate of speed. The new order of things which led to the purchasing agent specifying the very highest requirements imaginable in the way of cutting speeds and feeds for a tool necessitated the builders designing an especially powerful machine to meet his requirements. This tool has not supplanted the ordinary tool, however. It has rather supplemented it. This is simply because of the greatly increased cost of the former tool over the latter. The purchasing agent very frequently sacrifices his high ideas as to the required performance of a tool for the advantage in first cost, obtained through the purchase of the standard machine designed and proportioned to meet the more ordinary requirements.

Now that European, and particularly German, trade is picking up again steadily, the fact is freely commented upon by machinery builders here that the demand from these quarters is almost entirely for the high duty tools. In this connection it is remarked that the foreign purchaser is showing greater enterprise than many home consumers. The fact must be borne in mind that the European, and especially the German, consumer is constantly on the alert for new and advanced mechanical appliances, and his present increased patronage is doubtless entirely due to the ability on the part of the American machine tool builders to supply him with advanced types of tools. This emphasizes the necessity for American machinery consumers to purchase the best produced in their own country, for if they fail to appreciate the advantages they have right at home they may rest assured that their European competitors, who are not so lax, may alone reap the benefits of the most advanced agencies of production.

Railway Equipment Matters.

The list of improvements to be made and the supplies to be purchased this year by the Pennsylvania Railroad Company was approved by the Road Committee of the Board of Directors at a meeting held last Monday. This year the appropriations exceed by nearly \$25,000,000 the money expended on the same account last year, as they involve the expenditure of about \$75,000,000. A large amount of the contemplated work has been withheld pending the settlement of these appropriations.

A number of excellent inquiries have been received dur-

ing the week from the prominent car building and railway equipment concerns throughout the country, who it is generally known have recently received contracts from the principal railroads which will tax the present capacity of their plants to their limit for several months to come. Some of these contracts, it is understood, were placed for rather quick delivery, and in order to make these it will be absolutely necessary for the recipients of the orders to augment their shop equipments.

The most important machine tool transaction of the week was the placing of orders to the amount of about \$100,000 with the Niles-Bement-Pond Company by the Lehigh Valley Railroad Company. Specifications for these tools have been in the market for a long time, and the closing of the matter has been looked forward to eagerly for a number of weeks. The machinery is to be installed principally at the new shops of the railroad at Sayre, Pa., and includes a large number of heavy tools, all to be electrically driven. We understand that additional orders are to be expected from this quarter.

An announcement coming from Seattle, Wash., states that the Northern Pacific Railway Company will immediately begin the construction of eight six-story buildings, each of them occupying a half block, at a cost of about \$2,000,000. These buildings are to be located on the railroad's property in the heart of the wholesale district of Seattle, and will be used as warehouses, involving the installation of a considerable quantity of conveying and elevating machinery, power plant equipment and refrigerating apparatus.

The Davenport Locomotive Works, Davenport, Iowa, which, as we have previously noted in these columns, is greatly improving its plant, is now purchasing the required machinery equipment necessitated by the work. A number of machines for the new machine shop have already been secured, including a 60 x 60 inch planer, built by G. A. Gray & Co., Cincinnati, Ohio; a 3 x 36 inch flat turret lathe, built by Jones & Lamson, Springfield, Vt.; a 51-inch Niles boring and turning mill, furnished by the Niles-Bement-Pond Company, and a number of small lathes of miscellaneous makes. At the present time specifications are out for the boiler shop equipment, orders for which will be placed on or before March 15. This equipment includes complete hydraulic outfit for a 100-ton capacity, 12-foot 6-inch gap riveter and a 130-ton capacity sectional flanging press, including all the fixtures, accumulators, pumps and cranes. The other tools required, all of which are to be motor driven, are as follows:

Two single punches and shears, depth of throat, 36 inches; punching capacity, 1¼ hole, 1-inch plate; shearing capacity, 1-inch plate; attachments, patented multiple punching attachments, with spacing table. One Wangler bevel shear, latest pattern, capacity, ¾-inch plate. One plate bending roll to bend ½ to ½ inch plate to full circle, width of plate, 8 feet; upper rolls extended for counter balance and housing hinged for removal of plates bent; reversible power motion for forward and backward speeds. One plate bending roll to bend ½ to ¾ inch plate to full circle, width of plate, 12 feet; upper rolls extended for counter balance and housing hinged for removal of plates bent. One horizontal punch, 12-inch gap; capacity, 1 3-16 inch diameter through 1¼-inch plate; nose and punching attachments to suit punching of locomotive boiler work. One suspended drilling machine for flue sheets, mud rings and large sheets; Niles-Bement-Pond catalogue, page 304, or other make having same features. One Whiting or Hilles & Jones stake riveter for saddle tank and similar work. Capacity, ¾-inch plate; gap, 49 inches. One Acme stay bolt cutter, capacity up to 1½ inch stay bolts.

Municipal Projects.

At its meeting yesterday the Board of Aldermen of New York appropriated \$600,000 for the purchase of a site for the municipal electric lighting plant. The appropriation was carried without a dissenting vote, but some of the Aldermen charged the administration with being insincere concerning the project.

Proposals are now being readvertised for by the Sewage and Water Board, 602 Carondelet street, New Orleans, La., for an extensive equipment to be installed in the new pumping stations. The date set for the opening of the bids is April 18. F. S. Shields, secretary of the board, is sending out the specifications, which cover roughly the following apparatus: Four 20,000,000-gallon pumping engines, to work against a normal head of 218 feet; three 40,000,000-gallon centrifugal pumps, to work against a normal head of 15 feet; three engines, to operate these centrifugal pumps; one 20,000,000-gallon centrifugal pump, to work against a normal head of 12 feet; one engine, to operate 20,000,000-gallon centrifugal pump; two 150-kw., 550 volt, direct current generators; two engines, to drive these generators; six 400 horsepower water tube boilers; also all steam and water pipe connections and other appurtenances complete for operation within and connecting the boiler and pump house buildings. Specifications, general plan and blank form of proposal may be obtained at the office of the board.

Kenneth Allen, superintendent of the Water Department, Atlantic City, N. J., will open bids on March 28 for the

Water Commissioners for the erection of a new coal pocket, machine shop, with full equipment, and a quantity of coal handling machinery. Specifications are now being prepared.

Specifications have been issued by Alfred M. Quick, water engineer, Baltimore, Md., for a quantity of machine tools, proposals for which will be received until 11 o'clock a.m. Wednesday, March 15. The specifications call for one 16 and one 18 inch belt driven lathes, one 22, two 24 and two 30 inch motor driven lathes, and one motor driven vertical milling machine. The bids are to be submitted to the Board of Awards and addressed to the office of the City Register, City Hall, Baltimore.

New Plants and Extensions.

The Halcomb Steel Company, which is about to erect a large plant at Syracuse for the manufacture of crucible and high grade steel, is now getting its plans well on toward completion and is placing orders for building materials, machinery, &c. The officers of the company are as follows: C. H. Halcomb, president; F. B. Scott, vice-president; F. R. Hazard, treasurer; F. E. Wade, secretary.

The Niles-Bement-Pond Company is planning large extensions for the Bement-Miles plant at Philadelphia. The plans involve the transformation of the present large foundry into an erecting shop and the removal of the foundry equipment to Nicetown, Philadelphia, where the company has purchased the plant formerly operated by the Cresswell-Waters Company. A number of Niles cranes are to be installed at the new foundry plant, which will give it, together with the old Bement foundry equipment, sufficient capacity to easily handle all of the Philadelphia plants' cast iron work, and the space gained by the abandonment of the Bement foundry will facilitate the machine work at that plant very materially.

The machine tool trade is following the Westinghouse Electric & Mfg. Company, which is expected to soon have a large list of machine tools prepared, which are to be purchased for installation at the company's plant at Newark, N. J. This plant has been enlarged considerably during the last year, but the matter of machinery equipment has been steadily deferred. Members of the trade who have been looking after the matter are of the opinion that a great deal of machinery of the lighter types will be installed.

The Fawcuss Machine Company, 2820-2828 Smallman street, Pittsburgh, Pa., which makes a specialty of cut gears and bridge machinery, officially announces that it is prepared to increase its plant to just about double the present capacity. Most of the new equipment to be purchased will be in the line of heavy machinery, some of which has in fact already been secured. The new equipment will not all be purchased at one time, but will be picked up from time to time, as the new building nears completion. Thomas Fawcuss, vice-president of the company, has charge of the new work.

C. O. Snyder, 135 West Ninety-sixth street, New York City, is about to start a new machine shop and is desirous of receiving catalogues of all of the latest labor saving machine tools and accessories. Mr. Snyder is in the market at present for a number of lathes ranging up to 16-inch swing, including principally 16-inch swing machines having 2½-inch hole and spindle and draw in collets. He is also in the market for a number of small punches, presses and shears, together with milling machines, shapers, turret lathes, drill presses, grinding machines, electric portable drills and grinders, power cut off saws, polishing machinery and small shop tools, together with special tool steels, machine and wood screws, bolts, nuts, lock washers, cotter pins, &c.

Frank W. Keegan, 316-322 Hudson street, New York City, is in the market for a quantity of steel, brass, copper and bronze in sheet, bars, wire and tubes; also imported tubing, spring steel and special tool steels. He is also seeking equipment of small metal working tools for general machine shop use, and is desirous of receiving catalogues and trade information concerning these matters.

United States capitalists connected with the Electro Manganese Company, New York, at the head of which is R. E. Kingman, 542 Fifth avenue, have deposited \$50,000 with the Provincial Government of New Brunswick as a guarantee that they will erect a large electric plant at Grand Falls, where they expect to spend between \$3,000,000 and \$4,000,000 in developing various enterprises. Preliminary plans which are now being formed at the offices of Mr. Kingman, where all purchases of equipment will be made, will call for a plant of about 40,000 horse-power capacity. The plans of the promoters include besides the hydraulic development the operation of pulp, paper and saw mills and an electric railroad. The Electro Manganese Company has about completed extensive additions and the installation of new electric furnaces at its plant at Shawinigan Falls, near Quebec, and expects to be producing manganese in large quantities by early summer.

Power Plant Equipments.

The Westinghouse Electric & Mfg. Company is building for the Peoples Power Company of Moline, Ill., two engine type generators, to be installed in their power station. The company is an old one in that section of the country, and

has built up an extensive business in lighting and power work. The addition to its present equipment will be a 1100-kw., two-phase alternator, of the revolving field type, operating at 2400 and 4800 volts, and a 600-kw., 600-volt, direct current machine. The alternating current generator is a duplicate of a machine which the company put into service about a year ago. An order for three 300-kw., alternating current generators has also been placed with the Westinghouse Company by the Barber Lumber Company of Boise, Idaho. These machines will generate current at 440 volts, which will be transformed to 23,000 volts for transmission. The necessary transformers, switchboards and lightning arresters are included in the apparatus to be furnished.

Business Changes.

The business of the Fairbanks Company in Canada, including all its selling agencies, contracts, organization and warehouse stocks at Montreal, Toronto, Winnipeg and Vancouver, has been purchased by Henry J. Fuller, who has heretofore served the Fairbanks Company as its Canadian representative, with headquarters at Montreal, P. Q. Mr. Fuller has made this purchase in order to reorganize the business as a Canadian institution, and beginning March 15 the business will be conducted as the Canada Fairbanks Company, Limited, Mr. Fuller being president and treasurer. In addition to greatly extending the selling facilities of the company it is Mr. Fuller's intention to very shortly begin the erection of a large plant for the manufacture in Canada of certain specialties which are at present being imported by the Fairbanks Company. The new company will continue to represent a wide line of American manufacturers, which at present is represented in Canada by the Fairbanks Company and is as follows:

American Tool Works Company, Cincinnati, Ohio; American Wood Working Machinery Company, New York City; American Spiral Pipe Works, Chicago, Ill.; American Steam Gauge & Valve Mfg. Company, Boston, Mass.; Buhl Malleable Company, Detroit, Mich.; Brown & Sharpe Mfg. Company, Providence, R. I.; Bignall & Keeler Mfg. Company, Edwardsville, Ill.; H. A. Cole & Co., Liverpool, England; Emmert Mfg. Company, Waynesboro, Pa.; Foster Engineering Company, Newark, N. J.; E. M. Dart Mfg. Company, Providence, R. I.; Goubert Mfg. Company, New York City; H. W. Johns-Manville Company, New York City; Johns-Pratt Company, Hartford, Conn.; J. J. McCabe, New York City; Niles-Bement-Pond Company, New York City; Norton Emery Wheel Company, Worcester, Mass.; Oneida Steel Pulley Company, Oneida, N. Y.; Oster Mfg. Company, Cleveland, Ohio; G. M. Parks Company, Fitchburg, Mass.; Wm. Rutherford & Sons Company, Montreal, Quebec; Randolph-Clowes Company, Waterbury, Conn.; Reed Mfg. Company, Erie, Pa.; Reliance Machine Tool Company, Cleveland, Ohio; Riehle Bros. Testing Machine Company, Philadelphia, Pa.; Taunton Locomotive & Mfg. Company, Taunton, Mass.; J. B. Treasure & Co., Liverpool, England; Warner Instrument Company, Beloit, Wis.; Union Mfg. Company (chuck department), New Britain, Conn.; S. A. Woods Machine Company, Boston, Mass.; T. B. Wood's Sons Company, Chambersburg, Pa.; Wilmarth & Morman Company, Grand Rapids, Mich.; Warnock Mfg. Company, Worcester, Mass. The first move will be to remove the Montreal warehouse into new quarters at 444-446 St. James street on May 1 next, the old quarters on Craig street being retained for the present, as the extra space will be needed for the increase of business.

The Mahoning Foundry & Machine Company, Youngstown, Ohio, has purchased outright from the executors of the Estate of Mrs. Geo. B. Sennett and removed to its shops all drawings, patterns and material on hand used for the manufacture of punches and shears, together with good will, rights, privileges, &c. This line of punches and shears is the one originally brought out by the Reade Machinery Company of Cleveland, Ohio, and sold to the Geo. B. Sennett Company, and is one of the best lines on the market.

It is the purpose of the Mahoning Company to carry a full line of punches, shears and spare parts on hand in order to be able to make prompt shipments and properly care for its customers; also to make such improvements and alterations in the line as are necessary to suit the requirements of the individual users.

The Stockbridge Machine Company, Worcester, Mass., has made arrangements with the Niles-Bement-Pond Company by which the latter concern will handle the Stockbridge shapers in its New York, Boston, Chicago and London territories.

Henry E. Ide, trustee in bankruptcy, 21 State street, New York, announces that on March 14 the property belonging to the estate of the Townsend-Downey Shipbuilding Company on Shooters Island, Richmond County, will be sold at public auction, commencing at 11 o'clock in the forenoon. A considerable quantity of boiler shop and shipbuilding machinery, together with general machine shop equipment, will be involved. A detail list of the property to be sold may be seen at any time at the office of Mr. Ide.

A New York branch of A. L. Ide & Sons, Springfield, Ill., builders of Ideal engines, has been opened at 11 Broadway, in charge of J. G. Robertson.

The New England Machinery Market.

WORCESTER, MASS., March 7, 1905.

The steam engine builders and boilers makers of New England are not busy as a general rule. It had been expected that by this time there would be a good deal of business on the books, but the contrary is true. There is every indication of large manufacturing building, surprisingly large considering the great extensions of several years ago, followed by the period of business depression, but new power plants of any size are not numerous and very often present power facilities will take care of the contemplated buildings. Most orders for boilers are for one or two of medium power. One large contract just awarded is for the 12 tubular boilers, of 300 horse-power each, for the Worcester Electric Light Company, which was given the Stewart Boiler Works, Worcester. The machinery market remains unchanged, with a steady though not heavy demand, almost exclusively in small lots. As an index of general manufacturing conditions, the brass industry of the Naugatuck Valley is exceedingly prosperous from all accounts.

Wyman & Gordon, Worcester, Mass., manufacturers of drop forgings, contemplate making considerable additions to their shops at Worcester this season. The plans include an addition 40 x 80 feet to the forge shop, a one-story building, 30 x 100 feet, for heating and annealing furnaces, and a brick storage building. The present ovens will be moved to the new building, which will afford more space for other departments of the work in existing buildings. New furnaces will be required to supplement those now in use, and some new machinery will probably be installed, though the firm has added largely to its machine equipment during the past few months. The Wyman & Gordon plant at Cleveland, Ohio, recently put in operation, will not be enlarged this season, there being available space to take care of any necessary increase.

The New Home Sewing Machine Company, Orange, Mass., is to make large additions to its plant this season. The first building to be erected will be of brick, 56 x 221 feet, five stories high with subbasement. The company will rearrange in this building machinery which it already has, and possibly some new machinery will be required, though this cannot be stated as certain at this time. This building, together with another which is to follow, will enable the company to nearly double its present output.

The New Departure Mfg. Company, Bristol, Conn., has in contemplation the building of a considerable addition to its plant for the manufacture of bicycle and automobile parts, as well as two other lines which are not ready for announcement. This building will be 50 x 100 feet and four stories, according to the plans. In addition the company also contemplates installing a power plant to develop 750 horse-power. A final decision has not been reached, however. If the factory addition is built new machinery will be required.

Andrew Fyrberg has bought the Crooks, Root & Co. factory, Hopkinton, Mass., and will equip it for the manufacture of firearms. Mr. Fyrberg was formerly head of the firearms business now owned by Sears, Roebuck & Co., Chicago, and recently moved to Meriden, Conn.

The Carlow Automobile Company, Taunton, Mass., will equip the second floor of a building 50 x 125 feet as a repair and machine shop, in connection with salesrooms for automobiles. An electric plant for charging electric automobiles will also be installed. The company states it is not yet in a position to announce what new equipment will be needed.

The Sullivan Machinery Company, Claremont, N. H., is to build a new pattern shop on land recently purchased. The shop will be equipped with the latest types of machinery.

The Barrowsville Bleachery, Norton, Mass., will erect six buildings at Norton this season, including starch and mangle room, 63 x 163 feet, and two stories; bleach house, 52 x 106 feet, and two stories; kier room, 45 x 109 feet; boiler house, 41 x 45 feet; engine room, 23 x 31 feet, and pump house, 12 x 22 feet. The boiler and engine have been contracted for, but the company states that the machinery, shafting, &c., are yet to be purchased.

The Vaughn Machine Company, Peabody, Mass., is building an addition to its foundry.

The Henry & Wright Mfg. Company, Hartford, Conn., manufacturer of sensitive drills, has incorporated under Connecticut laws with capital stock of \$50,000. The incorporators are Robert G. Henry, Daniel M. Wright and Joseph H. King. The company manufactures a sensitive drill of new design, recently described in *The Iron Age*.

The Richard French Iron Works, Worcester, Mass., has been incorporated under Massachusetts laws with capital stock of \$3000, to continue the business formerly conducted by Richard French. Sarah A. French is the president; H. H. French, treasurer, and W. H. French, clerk. The company works iron and steel for structural purposes.

The city of Pawtucket, R. I., is contemplating the building of a new pumping station to contain a pumping engine with a daily capacity of 12,000,000 gallons. The matter is now before the City Council.

The Philadelphia Machinery Market.

PHILADELPHIA, PA., March 7, 1905.

Quite an improvement has occurred in the general machinery trade in this territory during the past week. Nearly all branches of the trade have been receiving substantial orders and a number of the shops are filling up with work, which, if it continues to come in as it has, will enforce extended deliveries in a number of instances. Some fair sized contracts have been closed recently, and while there has been no extensive demand for large and heavy tools, orders have been taken and deliveries made on a quantity of the medium and smaller class of tools. Inquiries on the whole are reported better and of a decidedly more encouraging tone. There is a particularly good inquiry for medium sized tools and for special machinery. Most of the recent inquiries have been for tools for replacement of older ones, some few for additional equipment, but nothing in the nature of equipment for new plants. The various railroads have recently sent out no specifications of importance, although it is said that bids will be asked on some large requirements before long. Foundries, both iron and steel, are more active than they have been for some little time, and with the opening up of better weather conditions expect to take on quite a lot of additional work. Machinery and machine tool dealers are very much encouraged by the present condition of the trade, the past week having brought out some fairly good sized orders for medium sized tools, with here and there a sale of a heavy one. Equipment for some small shops, embracing eight or more various tools, has also been closed up. The larger machine shops continue fairly busy, while the smaller shops have increased the volume of business in hand and look forward to quite an extensive business in the near future.

Benjamin F. Shaw & Co., steam fitters and engineers, Wilmington, Del. (whose purchase of the former plant of the Hoopes & Townsend Company at that point was announced in these columns last week), advise us that they will use the plant purchased in connection with their present plant at Third and Orange streets, in that city. Some of the equipment for the new plant will be moved from their old one, the new quarters being used as a boiler and tank shop, pipe cutting and bending department and for pipe storage. At this time they are not buying any new equipment, as they are not yet in shape to know what will be needed. They expect, however, to purchase a few new tools.

The Charles Ervin Company, tank, stack and boiler maker, will erect a new one-story shop, 120 x 136 feet in G street north of Venango street. The buildings will be of structural steel and corrugated iron. The machinery and tools for the new plant have already been contracted for.

Lovegrove & Co., Incorporated, boiler, engine and machinery merchants, at Third and Quarry streets, will on the 15th inst. open a branch store at 716 Arch street for the sale of mechanical specialties, gasoline engines, pumps, &c. The heavy machinery and engine business will continue to be conducted at the former location.

Eynon-Evans Mfg. Company reports an improved condition of trade. Inquiries are better in every department, particularly for heavy valves, condensers and jet blowers. The company is very busy in its foundry department, while the machine and pattern shops have taken on quite a lot of new work. Among other orders recently taken was one for 30-inch automatic free exhaust valves for delivery in the Pittsburgh district. A large order for acid resisting bronze castings for use in anthracite coal mines has recently been completed.

I. H. Johnson, Jr., & Co., Incorporated, during the past month made record shipments of lathes to their various customers, including heavy tools for the Bethlehem Steel Corporation, Carnegie Steel Company and other concerns in the Pittsburgh, Chicago and the local territory. They also completed deliveries on the orders for lathes received some time ago for the Driggs-Seabury Ordnance Company, Sharon, Pa. Inquiries have been good, and quite a number of orders have recently been taken. General conditions are favorable, they say, for business both for the present and near future.

The Royersford Foundry & Machine Company, Royersford, Pa., reports an improvement in conditions during the past few weeks. There has been considerable more inquiry, and the general prospects for business are considered very encouraging. A No. 3a double punch and shear, 18-inch throat, has recently been shipped to Brooklyn, N. Y., parties, and another of the same kind is ready for delivery to Gehret Bros., Bridgeport, Pa. The company also reports a very good business in its new line of power transmission machinery. Agencies for its specialties are now being established in many parts of the East and West.

The Nickle-Milnor Engineering Company, which has just removed its offices to the Drexel Building, Philadelphia, announces that it has been appointed representative of the C. & G. Cooper Company. This company builds Corliss engines for all purposes, making a specialty of heavy types for direct connected lighting and power plants. The Nickle-Milnor Company also represents H. R. Heinicke, Incorporated, builder of chimneys, and the Heron & Bury Mfg. Company, manufacturer of air compressors.

Chicago Machinery Market.

CHICAGO, ILL., March 7, 1905.

Business picked up smartly after the middle of February, with the result that that short month aggregated better sales than the 31-day month preceding, and was, perhaps, a little better than the same month a year ago. The good business of the last week of February continues to date. There is nothing extraordinary about it; but merely a healthy pick up business from day to day. Indeed some large factors, notably the second-hand machinery dealers, have scarcely felt the betterment at all. One hears of a famine in lathes, due to the large orders placed by the Japanese Government, chiefly in Cincinnati; but anybody who wants to buy a lathe, or 100 lathes, to-day will experience but little difficulty in securing satisfactory price and delivery in this city. Prices on machine tools are none too strong, and there is keen competition for every inquiry that shows its face on Canal or Clinton streets.

The International Harvester Company has been in the market for about \$6000 worth of boring machines and radial drills. The drills, or some of them, were placed Saturday morning, and the others were ordered this week.

The Chicago, Burlington & Quincy Railway is in the market for miscellaneous machines and tools aggregating about \$30,000; but, as far as can be learned, none of these tools has been placed up to date.

The South Side Elevated Railroad, in addition to the uncertain but probably large requirements in engines, boilers and other equipment for its power house, will require some time in the future a complete equipment for a machine and repair shop. Just what these requirements will be is not yet divulged.

The Chicago & Alton Railroad, E. V. Dexter, purchasing agent, Chicago, will shortly buy a miscellaneous machinery equipment for replacing old machines at its plant at Bloomington, Ill. Lists are not yet issued.

Municipal and Power Plant Equipment.

In a few days specifications will be prepared and bids asked on the boiler, stoker and smoke consuming requirements for city water works and sewer pumping plants referred to in *The Iron Age* of February 23. The City Hall boiler plant will require four 150 horse-power boilers, which will, for the present, be arranged for hand firing. The Harrison Street pumping station will require four 250 horse-power boilers, the plant being practically a duplicate of the Lake View pumping station, contracts for the four internally fired boilers for which were awarded last week to J. G. O'Neil, representing the S. Freeman & Sons Company of Racine. Specifications on the Harrison street plant will be issued in a few days.

New engines will be required in some of the water works pumping stations and new stations will be built. A pumping plant will be erected at 104th street and Stewart avenue, west of Pullman, in order to supply an adequate quantity of water to the large area 3 or 4 miles distant in every direction, which is now insufficiently supplied by the Sixty-eighth street pumping station. This station will call for three 20,000,000-gallon engines and about 1500 horse-power in boilers. A 3,000,000-gallon pumping engine will be required for the Washington Heights pumping station. A small engine will be purchased for the Norwood Park station, and this station will also require a new deep well.

Very extensive tunneling operations are projected by the city engineer. A tunnel 8 miles long and 8 feet in diameter, to cost about \$2,000,000, will be required to connect the new pumping station at 104th street and Stewart avenue, above referred to, with the Sixty-eighth street crib, and the crib will be enlarged in order to provide for the greatly increased water supply that this new tunnel will require. Much of the work on this tunnel must be done through solid rock, and there are a number of interesting engineering difficulties in the way. Another tunnel, 7 feet in diameter, is to connect the Chicago avenue crib with the Harrison street pumping station. This tunnel will be over 2 miles long. The present tunnel, which connects these points by a direct line, will be abandoned and filled, and the new tunnel will conform to the lines of the streets. This change is made necessary by the fact that many large buildings are going up, and the existence of the water works tunnel under privately owned property subjects the city to the constant menace of damage suits due to the settling of structures. Similarly, the inlet at Peck Court is to be connected with the Harrison street pumping station by means of a 7-foot tunnel. It has not yet been definitely settled by the city whether these tunnels shall be of brick or concrete, or if it has been decided the fact is withheld.

Bids received for the boiler plant for the Sixty-eighth street pumping station are held up by an injunction which prevents the department from opening bids or making award. It is expected that this obstruction will be removed shortly and the contract will be placed.

Chas. A. Smith, Denver, Col., has been granted a franchise for the construction of a water, light and ice plant at Woodward, Okla., and will commence work in two or three weeks.

The city of San Diego, Cal., proposes the sale of bonds necessary for the purchase of land and installation of a pumping plant thereon for additional water supply of the city. The amount of bonds to be sold will be in the neighborhood of \$350,000. H. W. Vincent is city clerk.

The awarding of contract for turbo generator and exciter sets for the drainage canal at Lockport, Ill., has been delayed in order to give the chief engineer and his staff an opportunity of hearing the arguments of the bidders. It is expected that the award will be made about March 15.

The Edison Electric Company, Los Angeles, Cal., is now preparing specifications for a 25,000 kw. installation at Kern River, No. 1 power plant, and will send them out within 30 days. The installation will be for water wheels to be direct connected to tri-phase generators operating under a net effective head of 865 feet. The company has just issued specifications for about 1000 steel towers, varying from 30 to 60 feet in height, to be used in its proposed transmission line to Los Angeles, which will be 116 miles long.

The Winona Interurban Railway Company, Winona Lake, Ind., will erect a power house, which, with its equipment, will cost \$600,000. Sargent & Lundy, Chicago, have been selected by the company as engineers.

The Vanderbilt lines entering Chicago are stated to be contemplating the expenditure of over \$1,000,000 in extending the Big Four road into the city and connecting the Lake Shore, Michigan Central, Nickel Plate and the Big Four with all of the important manufacturing industries in the city by means of belt lines and switch tracks. A large tonnage of rails and other equipment will be required if these plans are carried out. Included in the plan is a double track line between Chicago and Danville, Ill., to tap the rich coal fields in that district which have heretofore been served only by the Chicago & Eastern Illinois Railroad. Entrance to Chicago will be by way of the Indiana, Illinois & Iowa and the Indiana Harbor railways.

The Charles F. Elmes Engineering Works, Chicago, has just purchased 139 feet of improved property on Morgan street, adjoining its present plant, which will give the firm a full block on Morgan street extending from Lake to Fulton streets. The purchase was made to give the plant increased space made necessary by the rapid growth of its business, particularly to give adequate space for the construction and erection of hydraulic presses for making brick and concrete. The firm has not yet decided what new machinery will be required for this extension, or whether it will utilize the buildings now occupying the land purchased, or will replace them with a modern steel structure.

The American Car & Foundry Company, St. Louis, Mo., will build an addition to its car plant at Madison, Ill., providing facilities for the building of steel underframe cars at that point. The shops at Jeffersonville, Ind., are also being equipped for the same purpose. With the plants at Detroit, Mich., Berwick, Pa., and Huntington, W. Va., and the completed improvements at Madison and Jeffersonville the company will have a daily capacity of about 250 steel cars.

Adams & Schwab, Chicago, have placed the following contracts for Sears, Roebuck & Co.'s new plant: Aultman-Taylor Company, eight 500 horse-power Cahall horizontal water tube boilers, 5000 square feet of heating surface each, including Aultman-Taylor stokers; superheaters for this plant were placed with the Powers Specialty Mfg. Company; four 750 kw. engines were placed with the Allis-Chalmers Company, together with Bullock generators for each; 15-ton traveling crane for the power plant was let to the Whiting Foundry Equipment Company, Harvey, Ill.

Changes in Chicago Machinery Firms.

Horace A. Stocker, formerly secretary and treasurer of McDowell, Stocker & Co., dealers in machine tools, 59-61 South Canal street, Chicago, has established an independent business under the name of the H. A. Stocker Machinery Company. Temporary warerooms have been rented at 51 South Canal street, into which a stock of machinery is being moved. A new two-story and basement warehouse, 48 x 135 feet, is being erected for Mr. Stocker at 20 to 22 South Clinton street, and as soon as this is completed the business will be transferred to it. This new store is next door to that of the Brown & Sharpe Mfg. Company, and directly opposite C. H. Besley & Co. and Samuel Harris & Co.

Frank H. Huschart, since its organization the secretary and treasurer of the Marshall & Huschart Machinery Company, Chicago, withdrew from the firm March 1, his successor being Wm. H. Reid, who has been associated with the firm for four years. It is understood that Mr. Huschart has sold all his interest in the firm to Mr. Marshall.

The Dover Forge & Iron Company, Canal Dover, Ohio, is operating its puddling mill to full capacity making high grade iron bars. The knobbling department has been enlarged and is in operation on charcoal iron, tin bars and sheet bars, for which the company has a very large demand.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 6, 1905.

The week just closed has been fairly active in machinery circles, and a number of the plants are running to their full capacity. Inquiry, both foreign and domestic, has developed in a marked degree, and the outlook for increased demand during the next 30 days is very promising. Some of the shops have even found it necessary to work their force overtime in order to handle the business that they have booked, but as a general rule manufacturers are very much disinclined to do this, as the men do not take to it kindly and it invariably causes more or less friction. The indications are that the early spring will see the structural people rushed, as a great number of new buildings are to be erected involving the expenditure of large amounts of money. Several of the railroads that center in this city have decided upon extensive improvements to their lines and they will erect numerous bridges and other structures during the early spring. The Baltimore & Ohio Southwestern Railroad will erect 12 steel and concrete bridges and 18 or 20 smaller ones. In addition to this they will lessen a number of the curves along the right of way, and over 2000 tons of 85-pound steel rails will be necessary for this improvement.

The meeting of the National Machine Tool Builders' Association will be held at Washington, D. C., on April 11 and 12. The Committee on Various Plans of Motor Driven Machinery, with their recommendations, will report at this time, as will also the Committee on Tariff. The question will be agitated of making all lathe spindles the same size, regardless of make, so that the parts of the different machines may be interchangeable.

Retirement of Fred. Holz.

The Cincinnati Milling Machine Company has made some changes in the *personnel* of its directory. Fred. Holz, president of the concern, having desired to retire from active service, has resigned his position, disposing of part of his holdings to Fred. A. Geier. The organization of the company was formerly as follows: Fred. Holz, president; G. A. Mayer, vice-president; Fred. A. Geier, secretary and treasurer; C. Wood Walter, assistant secretary and treasurer. The company has been reorganized, the stock being distributed among the active workers of the concern. The new officers are as follows: Fred. A. Geier, president; C. Wood Walter, secretary; G. A. Mayer, treasurer. These gentlemen, with E. M. Chace and Phil. O. Geier, compose the present Board of Directors. The company is enjoying a fine business and is making further extensions to its plant.

Foundries Change Ownership.

The following circular has been received from the Weber Foundry Company:

"CINCINNATI, OHIO, March 1, 1905.

"We hereby announce that on January 28, 1905, we sold all our real and personal property in Newport, Ky., contracts, assets, liabilities and book accounts to the Newport Foundry Company of Campbell County, Ky. Also that on January 30 we purchased the foundry plant, contracts and good will from the Wessling Brothers, who have operated a foundry in the steel and concrete building at McLean and Sherman avenues, Cincinnati, also that the name of our corporation has this day been changed to the Weber Foundry Company, and as such will continue to make gray iron castings for the trade."

This company has been organized with a capital of \$10,000 and a capacity of 20 tons daily. The directors are: H. J. Weber, president; Wm. Weber, vice-president and secretary; G. L. Weber, treasurer; George C. Martin, Harry Greenwald and Louis Weber, directors.

Notes from the Machine Tool Plants.

The American Tool Works Company has found it necessary to increase its equipment by adding about 30 tools of various kinds, such as Brown & Sharpe gear cutters, Jones & Lamson flat turret lathes, milling machines from the Cincinnati Milling Machine Company, and turret lathes, engine lathes and radial drills of its own make. It appears that the company has been gradually falling behind on orders and deemed it necessary to have its men work overtime in order to increase the output. On last Saturday the men were notified that, beginning that afternoon, they were to work on Saturdays full time until the business was in such shape that overtime should again be unnecessary. Up to the closing time at noon on Saturday the men seemed to be agreeable to the plan and it was assumed that all was satisfactory. However, when 1 o'clock came 35 planer hands failed to return, refusing to work more than 55 hours per week. A visit to the plant on Monday morning, however, showed that with a few exceptions all have returned to work on a 59-hour schedule.

The Bradford Machine Tool Company is working overtime and has added several drill presses and milling machines to its equipment to take care of the orders. Foreign trade appears to be an important factor at present and the company is shipping numerous tools abroad.

The R. K. LeBlond Machine Tool Company has recently put upon the market a No. 5 plain milling machine which

is meeting with an excellent demand. The capacity of the plant is taxed to the utmost at present, and new orders are coming in briskly.

The firm of Smith & Mills is behind in its orders, principally of domestic origin. Last week it shipped one 20-inch crank shaper to Moscow for the Russian Government. About the same time a shipment was made of four medium size shapers to Japanese territory.

The John Steptoe Shaper Company has found it advisable to increase the working hours per week to 62½. This is made necessary by the recent large increase in both foreign and home consumption in its line. The company received an additional order for two shapers for Tokio shipment to be made via San Francisco.

The Oesterlein Machine Tool Company is now in its new quarters on Spring Grove avenue. The company has added a tool grinder and a horizontal drill to its equipment and will further increase the capacity by the addition of more tools as fast as occasion demands. The plant occupies the first floor and basement of the building.

The Hisey-Wolf Machine Company occupies the second floor of the Oesterlein building, having an exceptionally well lighted room, 50 x 150 feet, and four large rooms used as office, equipped with all the modern conveniences. Since entering the new quarters the force has been doubled, and four lathes, a milling machine, an automatic pinion cutter and an electric light plant giving from 75 to 250 volts used for testing purposes have been added. The power is received from the Oesterlein Company.

M. L. Andrew & Co., manufacturers of special machinery, multiple wood boring and iron drilling machines, occupy the third floor of this building, with conditions the same as the floors below. The company has added to its equipment several lathes, milling machines, shapers, and a radial drill. If conditions continue as they are at present it will be necessary to augment this equipment in the near future.

The Stewart Company Iron Works reports that structural business is better, but margins are very close. The company is doing considerable estimating for proposed structures. R. C. Stewart, Jr., who was seriously injured by one of the employees some weeks since, is improving and will soon be out again.

Hamilton News.

The Niles Tool Works Company of Hamilton recently made a shipment of a large armor plate planer, weighing 500,000 pounds, to the Midvale Steel Company. Rumors have been rife for some time that the company is anticipating removing its plant from Hamilton, and some of the papers have even gone so far as to name the city to which the plant will be taken. This, according to the officials, is incorrect, and nothing definite has been decided upon. If the city will condemn Second street, or a portion of it lying directly in the rear of its plant, so that it can be expanded, it is the intention of the company to remain at the present location and spend considerable money in the way of improvements and betterments. If this cannot be arranged the understanding is that it will change the location of its plant. The City Council now has the matter before it, and is expected to take some definite action within the next month or so.

The Black-Clawson Company, Hamilton, Ohio, has in view the remodeling of its machine shop, plans for which are now being prepared. With this change the company expects to install electric drives for all its shop equipment and will then be in the market for lathes, boring mills and special machinery adapted to the manufacture of paper mill machinery. Recently the company shipped one of its large machines, consisting of 24 carloads, to the Le Roy Paper Company at Carthage, N. Y., and also several other shipments to various parts of the United States.

Government Purchases.

WASHINGTON, D. C., March 7, 1905.

As work on the construction of the Panama Canal is progressing purchases of machinery in larger quantities are becoming necessary. At the present time the Canal Commission is preparing specifications for saw mill machinery, consisting of a large automatic railway cut off saw, capacity, 13¼ x 18 inches; one No. 45 rolled double cylinder planer and matcher, capacity, 24 x 6 inches; one No. 4 car ripping saw, capacity, 15 inches; one No. 109 band rip saw, capacity, 14 x 28 inches. Purchase will soon be made of a 100-ton steam wrecker and certain material and parts for repairing a number of the old French dump cars.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until April 1 for three electric traveling cranes for the Portsmouth Navy Yard.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until April 15 for a 5-ton electric traveling crane for the Puget Sound Navy Yard.

The Constructing Quartermaster, Fort Townsend, Washington, will receive bids until March 24 for pumping machinery and for the construction of a boiler and pump house at Fort Casey, Wash.

Trade Publications.

Boring and Turning Mills.—Colburn Machine Tool Company, Franklin, Pa. Bulletin No. 15, describing 53-inch boring and turning mill, which was illustrated in *The Iron Age* of December 8.

Belt Conveyor.—The Ridgway Belt Conveyor Company, 29 Broadway, New York City. Circular. Describes the Ridgway two-belt conveyor system, showing it diagrammatically and by photographic views. Much is said regarding the advantages of two-light belts instead of one heavier one.

Feed Water Heaters and Purifiers.—Warren Webster & Co., Camden, N. J. Pamphlet. Deals with the cardinal points of the Webster water heater and chemical purifier. The need of water purifying and the evil effects of scale are among the points which the text covers.

Band Saw Sharpeners.—Southern Supply Company, 161 North Commerce street, Mobile, Ala. Circular. Shows the new Covell latest improved automatic band saw sharpener, automatic lap grinder, stretcher, brazing table and automatic circular saw sharpener, all of these machines being built by the Covell Mfg. Company, 8 South Canal street, Chicago, Ill.

Electric Clutches.—Williams Electric Machine Company, Akron, Ohio. Catalogue A; 70 pages, size 6 x 9 inches. Describes the Williams' electric safety clutch recently patented and illustrates a number of its applications. Among the many advantages which are mentioned, a very impressive one is the fact that it can be instantly operated from a distant point. It is made in various sizes, the largest illustrated in the book being capable of transmitting 600 horse-power at 100 revolutions per minute. The latter part of the book contains a considerable amount of useful information and a few testimonial letters.

Large Fly Wheels and Hard Wood Lagging.—Dodge Mfg. Company, Mishawaka, Ind. Publication No. 61. Deals with the company's excellent equipment for the making of large fly wheels, balance wheels and wood rim pulleys for ropes or belts. It illustrates a number of notable jobs in this class of work. These range in sizes up to 32 feet in diameter by 9 feet face. Other views show the interior of the works where these wheels are manufactured. Part of the text describes the Dodge wood rim fly wheels and the Dodge system of hard wood lagging. One of the notable wheels shown is 24 feet in diameter with a width of face of over 12 feet. It was built in three sections, weighed over 210,000 pounds and required six cars for shipping.

Labor Saving Tools.—Gisholt Machine Company, Madison, Wis. Loose leaf for catalogue insertion, pages 19 and 20. Shows a view of the exhibit of labor saving tools which this company had at the St. Louis Exposition, and for which it was awarded a grand prize.

Nickel, Manganese and Carbon Steel Castings.—Massachusetts Steel Casting Company, West Everett, Mass. Pamphlet. Announces the purchase and reorganization under the foregoing title of a property formerly owned by the United States Steel Company. It gives a few words concerning the properties of the various classes of steel castings which it is prepared to furnish, these including nickel steel castings, manganese steel, carbon steel and dynamo magnet steel.

Grinding Machinery.—J. G. Blount Company, Everett, Mass. Pamphlet describing a line of bench and floor grinding machines. These include Nos. 1 to 7, adapted to handle wheels from 8 x 1 x 1½ inches to 24 x 4 x 2 inches. A view is given of each size with a table of specifications.

Steam Gages and Valves.—The Crosby Steam Gage & Valve Company, 78 John street, New York. Circular. Gives small illustrations and brief descriptions of pressure or vacuum, ammonia, hydraulic, altitude, combination water works, compound pressure and vacuum and standard test gages, pop safety, water relief, blow-off, globe and angle valves, pressure recorders, steam engine indicators, pressure gage testers, revolution counters, &c.

Shaking Grates.—Donegan & Swift, 6 Murray street, New York City. Illustrated circular. Describes Swift's Imperial clinker crushing shaking grate bar. Illustrations show the bar applied to furnaces of various forms and sizes, including circular furnaces, and the principle of their operation. Other illustrations show the Vortex Twentieth Century steam blower for forcing draft under furnace grates, Twentieth Century draft inducers, and the Imperial rocking and dumping grate.

Dental Lathe Motors.—Holtzer-Cabot Electric Company, Brookline (Boston), Mass. Booklet No. 144-A. Illustrates direct and alternating current lathe motors and attachments, such as arbors, &c., for dental work.

Valves.—Hancock Inspirator Company, 85 Liberty street, New York City. Illustrated catalogue; 24 pages, 6 x 9 inches. Describes the Hancock globe, angle, 60-degree and cross valves, this being the first catalogue in which a full description and price-list of all styles and sizes of valves have been given. The valves are tested and guaranteed tight under a hydraulic pressure of 1000 pounds, and are capable of standing an ultimate stress of 4000 pounds without distortion. The Hancock globe valve was illustrated in *The Iron Age* of January 5, 1905.

Grinding Wheels.—American Emery Wheel Works, Providence, R. I. Illustrated catalogue; 75 pages, 6 x 9 inches. Illustrates a complete line of emery and corundum wheels in all standard forms and sizes, and also a very complete list of special wheels. The first few pages deal with the company's

processes and methods and various kinds of wheels, including vitrified, silicate, elastic and corundum wheels. It also describes the tests to which they are subjected. Useful information is given in the shape of safe speeds, rules for calculating speeds and diameters of pulleys, &c. A key is given to the grades and numbers in which the wheels are classified. The remainder of the book takes up the various forms of wheels, showing them in section, giving brief specifications, prices and code words.

Corliss Engines.—Murray Iron Works Company, Burlington, Iowa. Four books of *fac-simile* testimonial letters from customers. The testimonials are grouped in four classes, there being a separate volume for each. The first is confined to engines connected with electrical work; the second, railroads, packing houses, mines and smelters, implements and wagons, iron and brass works, cotton mills, beet sugar works, lumber mills, wood workers, brick makers, breweries, hotels, ice factories, &c.; the third to flour mills and elevators, and the fourth to oil mills. The collection is rather remarkable for the diversity of features which the owners of the engines find praiseworthy, and also for the number of the letters, there being in all some 310. Many of the letters also mention the Murray boilers.

Universal Grinders.—Oesterlein Machine Company, Cincinnati, Ohio. Circular. Gives brief description and several illustrations of the Oesterlein universal cutter and tool grinder No. 2, with table of specifications. Several widely different grinding operations are shown in the illustrations.

Automobiles.—Pope Mfg. Company, Hartford, Conn. Small catalogue of Pope-Hartford, Model B, improved automobiles.

Coal Handling Machinery.—Borden & Selleck, 48 Lake street, Chicago, Ill. Booklet No. 8. Contains testimonial letters and half-tone views of coal yards and coal handling equipments installed by this company. The latter part contains special apparatus, including an automatic car loader, yard scraper, Champion gas and gasoline engine, coal chutes and a double clutch car starter.

Valve Setting Machine.—Naylor, Sons & Co., 209 J street, Sacramento, Cal. Circular. Describes and diagrams a model for laying out the valve mechanism of an engine, to ascertain the correct position of the eccentrics in relation to the cranks, and the amount of lap that should be given for the best port opening and steam distribution. It is the invention of Ernest W. Naylor.

Air Compressors.—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York. Catalogue No. 35. Consists of advance sheets of catalogue No. 36 on the subject of air compressors. Includes some information additional to that appearing in the first edition of No. 35, which was noticed in *The Iron Age* of August 18, 1904. There are new views of several important installations, including those of the Cleveland Stone Company and the Mare Island Navy Yard. Air receivers and inter and after coolers are also given space. The complete catalogue No. 36 is to be issued later.

Variable Speed Motors.—Crocker-Wheeler Company, Amper, N. J. Flyer No. 253. Illustrates and gives specifications of a new line of variable speed motors.

Injectors.—Schutte & Koerting, Twelfth and Thompson streets, Philadelphia, Pa. Folder. Pertains to the Koerting universal double tube injector. Illustrates its application to a locomotive and a steamship boiler, and describes the principle of its action, making use of a sectional diagram.

Air Compressor.—Norwalk Iron Works Company, South Norwalk, Conn. Circular. Subject, "Something New in Air Compression." Describes an air compressor from which two pressures may be obtained at the same time. This compressor was illustrated in *The Iron Age* of January 12, 1905.

Electric Motors.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Folder No. 4030. Describes Westinghouse type S motors for direct current circuits. Illustrations show the application of the motor to the driving of machine tools and also the motor individually in the several forms in which it is made—i.e., in inclosed, semi-inclosed and open horizontal form and with vertical shaft.

Electrical Apparatus.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. New bulletins and index to extant bulletins. No. 24, compound starting and regulating rheostats with underload release; No. 25, the same with underload and overload release; No. 71, accessories for self starters; No. 76, compound reversible slate front type machine tool controllers; No. 87, inclosed resistances; No. 88, inclosed nonreversible compound controllers, style U. C.; No. 88½, ditto, style O. B., the same with the addition of an overload device; No. 89, ditto, style U. R. C., the same as U. C., with three reverse points provided; No. 89½, ditto, style O. R. B., the same as style O. B., with three reverse speeds; No. 100, tables of motor ratings, fuses for motors, standard release spools for automatic starting rheostats and magnet spool data.

Automatic Engine.—Watertown Engine Company, Watertown, N. Y. Circular. Concerns the Watertown automatic engine made in single cylinder pattern for high, medium and slow speeds, horizontal and vertical form, in various capacities, the extremes of which are 15 and 1000 horse-power, and in compound cylinder form, both tandem and cross, horizontal and vertical, for high, medium and slow speeds, in capacities the extremes of which are 25 and 1500 horse-power. An insert contains a half-tone illustrating a typical Watertown automatic engine.

Bench Press.—Manville Bros. Company, Waterbury, Conn. Circular. Describes the Yankee bench press, which is designed to take the place of an ordinary foot and screw press.

HARDWARE.

IT is interesting to note that the course of things in many parts of the country is such as to encourage the customers of the retail trade to visit much less frequently than formerly the stores with which they deal. One of the objections brought up by local merchants to the rural free delivery is that it removes one of the occasions which used to bring farmers to town, and that in consequence they are not seen as often by the Hardware and other merchants from whom they purchase their supplies. Without going into the question whether such rural delivery is, on the whole, detrimental to the interests of local trade, there is certainly some advantage to those upon the rural delivery routes, for they are thus saved the necessity of making a trip to the village simply for the purpose of posting or receiving mail, inasmuch as in this way there is removed a temptation to the spending of time unproductively, which is the bane of many a farming community. The rapidly increasing use of the telephone and the constant extension of trolley service, coupled as it is often with express service of growing efficiency, have both an important influence in making it easy and natural for the farmer to make less frequent visits to his market town. He thus finds himself like the merchant from whom he buys—able with little difficulty to purchase many regular supplies without visiting the market. The retail merchant may regret this, or, taking a broad view of things, may recognize this condition as in the line of progress. Instead of fighting with the facts and spending his energy in opposing changes which he would after all be powerless to avert, it is obviously wise for him to accept existing conditions and adjust his methods so as to make them contribute as far as possible to his advantage. If his customers are less and less coming to town and visiting his store, it becomes more and more necessary to see to it that he gets into even closer touch with them, so that their purchases may be from him and not from some one else whose methods appeal to them more successfully. If the printed matter of the catalogue house militates against his interests, it becomes him to see to it that his own printed matter serves him with all possible efficiency. If letters or appeals from a distance tend to secure the trade of those whose custom belongs to him, he must see to it that similar methods are utilized to advance his interests. If he as a merchant finds it unnecessary to go to market at all frequently, he must not be surprised to find a similar disposition on the part of his patrons, and if those who desire to sell him goods are willing to solicit his trade there must be a corresponding readiness on his part to solicit the trade of those in his territory. If it is found that business in the retail field is to be secured to any considerable extent by those who go out for it, it is obvious that merchants who are most prompt and most enterprising in such outside efforts will have an advantage over those who prefer to wait for the business to come to them.

Our readers will note with satisfaction that the various efforts to secure legislation looking to the establishment of a parcels post system were defeated in the closing hours of Congress. The pressure brought to bear upon the Senate and the House in favor of the various projects came almost exclusively from comparatively few interests, which would be served by such a system. The grave objections, however, on the score of public policy induced Congress to turn down the projects. One

of the main considerations undoubtedly was that any action in the direction of the establishment of a parcels post would involve an increase in the unprofitable business of the Department and tend to swell materially the large deficiency. It is interesting to note, as narrated in another column by our special Washington correspondent, that the influence of the retail Hardware associations in their clearly and forcibly expressed opposition to the parcels post in any of the forms suggested had much to do with the defeat of the various schemes. It must not, however, be fancied that those in favor of utilizing the mails for the carriage of merchandise will accept their defeat as final. There is little question that the matter will come up at the next session. Meanwhile there is an opportunity for a more thorough discussion of the subject, that the really objectionable features of the project may be apprehended by the public, some of whom are apt to give their approval without due consideration to anything which is branded reform or progress. It is accordingly incumbent upon Hardware and other trade associations to be alert and inform their members and all within reach of their influence in regard to the principles which should apply in such matters. With an intelligent understanding of the subject by the manufacturing and mercantile classes and by the people at large there is little reason to fear that Congress will take unwise action in the direction proposed. Under existing circumstances the retail Hardware merchants of the country are not only entitled to special credit for the energy and wisdom of their protests, but they have a corresponding responsibility to see to it that legislation such as was so recently a threatening menace to commercial interests and at the same time so contrary to sound policy is not permitted to slip through Congress through ignorance or indifference on the part of the trade or the public.

Condition of Trade.

No marked change is noted in regular trade channels. Prices are well maintained and there is a strong undercurrent favorable in character, with occasional advances when forced by an enhanced cost of material. Remarkable unanimity is observed among manufacturers, wholesalers and retailers regarding the course of business once it begins, which it is agreed lacks nothing but a touch of spring for a primer. Known conditions unmistakably forecast a rush of activity, which is only kept in abeyance by a severe, lingering winter. A normal amount of trade has been and is being carried on, generally speaking, despite the vexatious hindrances of widely distributed low temperatures. The familiar interminable complaints as to transportation entanglement, strayed cars, long overdue freight, frozen rivers, with all that they mean in delayed tonnage, and the old, old story of difficulties in getting about by man and beast, are known to all. Well informed merchants reiterate that when real activity does begin the distributor with goods at hand or about to be delivered will be rewarded by the opportunity to do a profitable business, which will be envied by the tardy ones who have hesitated and are consequently more or less embarrassed by lack of supplies. The enormous orders already placed by many of the trunk line railroads for rolling stock, both motive power and cars, indicate unmistakably what these observant managers expect, with their exceptional facilities for knowing conditions. The foundation for continued good business is the succession of large crops at high prices for a number of years and the long continued steady employment for all who want it at the highest wage of modern times, which

has necessarily increased the purchasing power and per capita money circulation. The absence of important unsettling Governmental questions and probable fixed character of national administration for several years, together with the great increase in exports, especially in manufactures, not to name other causes, seem to indicate satisfactory business conditions for the near future.

Chicago.

A comparative calm has settled down over the Hardware markets, the reason being that during the period of rapidly advancing prices earlier in the year the great majority of retailers covered their requirements well into the spring and are now well stocked. Until the consuming demand for spring goods depletes these stocks buying will not be active. However, there is nothing discouraging in the situation, but, on the contrary, all indications point to an excellent season. The ten days of warm spring weather that we have had have acted as a tonic to the trade and have stimulated business considerably. The demand for Builders' Hardware continues active, particularly in the medium priced goods for popular consumption, while there is a prospective demand for large quantities of high grade goods for large office buildings, banks and similar public institutions. No large contracts for Builders' Hardware have been placed in Chicago during the week, but a number are being figured on by mill agents and jobbers. The big terminal building at New Orleans and the Fourth National Bank at Cincinnati are both in the market for Builders' Hardware. Rather heavy buying on the part of jobbers preceded the advance in Builders' Hardware March 1, and it is expected that trading will be light for some weeks, until the goods bought in February shall have been absorbed. Another advance is thought to be contemplated, as many lines of Builders' Hardware are still a good deal lower than they were last fall, when the cost of raw materials was less than it is now. The prospect of an advance in the price of Wire and Wire Products is leading to the placing of large orders by wholesale and retail dealers as well as by consumers. The advance of 7½ per cent. on Eaves Trough and Conductor Pipe some weeks ago was not taken seriously by the trade at first, and, in fact, many producers continued to sell at the old price, but within the last week the markets have stiffened up and as far as can be learned every one is charging the advanced price, and local dealers have made corresponding increases in the selling price of the products affected. Business in this line of goods is very active, with the encouraging sign that orders now being received are for immediate shipment; in other words, they are actual and not speculative.

NOTES ON PRICES.

Wire Nails.—Mills still have their books well filled with contract orders, but specifications on contracts are being received somewhat more slowly than for some time. The trade ordered ahead very freely some time ago. The results of heavy storms are still being felt in delayed deliveries. While blockades have been broken and cars have been started to their destination, lack of terminal facilities is interfering with their prompt receipt. Quotations are without change, as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.80
Carloads to retailers.....1.85

New York.—Stocks in jobbers' hands are broken in assortment to some extent, owing to delays in transportation from mill. This causes a temporary scarcity of some sizes. Demand is moderate on a firm market. New York quotations are as follows: Single carloads, \$1.99; small lots from store, \$2.05.

Chicago, by Telegraph.—Early warm weather has brought with it an unusually large tonnage of business. Prices are firm and mills uniformly restrict their contracts to 60 days' dating. Quotations are as follows: \$1.95, base, in car lots to jobbers; \$2 to retailers, with 5 cents extra for less than car lots from mill.

Pittsburgh.—There is a distinct lull in the new de-

mand for Wire Nails, due to the inclement weather and also to the fact that the large trade covered its requirements for several months ahead before the recent advance of 5 cents a keg in prices was made. The mills still have plenty of contracts on their books, but specifications on these are not coming in as freely as they did some time ago. There is some delay in deliveries of Wire Nails owing to car shortage and the difficulties the mills are having in getting prompt deliveries of Steel. We quote Wire Nails in carloads to jobbers at \$1.80; carload lots to retailers, \$1.85, and in less than carloads at \$1.90, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—Comparatively little new business is being received by the mills and specifications on contract orders are restricted in volume. With more settled weather, which will be conducive to outside operations, present conditions are expected to be reversed. Quotations are as follows: Carload lots, \$1.80; less than carload lots to jobbers, \$1.85, and to retailers, \$1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

New York.—No change has taken place in market conditions. While the demand is steady it is of moderate proportions. New York quotations are as follows: Carloads on dock, \$1.94; less than carloads on dock, \$1.99; small lots from store, \$2 to \$2.05.

Chicago, by Telegraph.—Cut Nails are officially offered at the same base price as Wire Nails, the following being the Chicago quotations: \$1.95 for car lots to jobbers for Steel Nails; \$2 in car lots to retailers; 5 cents extra for less than car lots, and from 5 to 10 cents extra for Puddled Iron.

Pittsburgh.—New business in Cut Nails is light, due largely to the restriction in outside building operations caused by unfavorable weather. The mills have more or less contracts on their books, but buyers are not specifying on these as freely as desired. We quote Cut Nails as follows: Carload lots, \$1.75 to \$1.80; less than carload lots to jobbers, \$1.85, and to retailers, \$1.95, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents per keg advance over Steel Cut Nails. The above price of \$1.75 on Steel Cut Nails is the minimum of the market and is obtainable only by the large trade and for desirable orders.

Barb Wire.—In the West the demand is quite active, while from Eastern territory the requirements are not so large. An increase in the volume of business is anticipated a little later in the season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Chicago, by Telegraph.—The demand is active and, if appearances count for much, an extremely large tonnage of Barb Wire will be sold during the spring. Quotations are as follows: Car lots to jobbers, Painted Wire, \$2.10; Galvanized, \$2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, \$2.25; Galvanized, \$2.55; Staples, Bright, \$2.05; Galvanized, \$2.35.

Pittsburgh.—The new demand for Barb Wire is very light, but there are still some unfilled contracts on which buyers are specifying. A material increase in business is expected within the next month or two and prices are being well maintained. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Smooth Fence Wire.—A diminished demand is noted for current requirements. Prices are firm and a large volume of business is looked for with more settled weather. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....\$1.65
Retailers, carloads.....1.70

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized...\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago, by Telegraph.—Smooth Fence Wire in some gauges is hard to get, particularly Galvanized. Prices are firm and no one would be surprised at another advance. Quotations are as follows: \$1.80, base, for Annealed Wire, in car lots to jobbers; \$1.85 in car lots to retailers, with 5 cents advance for less than car lots, and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—The current demand is light, but is expected to be much heavier in a month or six weeks as soon as spring trade opens up. The inclement weather has held back a good deal of business and there will likely be a rush of orders just as soon as outside operations are started. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....\$1.65
Retailers, carloads.....1.70

Chain.—In accordance with the intimation given in our last issue an advance of \$2 per ton has been made in the price of Coil Chain on account of the increased cost of the material. Similar advances have been made in the prices of other Chains.

Rope.—Manufacturers report business as quite good and the demand larger than during February. The tone of the market is firm. Quotations are as follows: Pure Manila, 11¼ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Paris Green.—The agreement on the schedule prices made early in the season is adhered to, as given below. There is not much being done by the trade in the way of placing orders. Quotations are as follows:

	Per lb.
Arsenic kegs.....	12 c.
Kegs, 100 to 175 pounds.....	12¼c.
Kits, 14, 28 and 56 pounds.....	13¼c.
Boxes, 2 and 5 pounds.....	13½c.
Boxes, 1 pound.....	14 c.
Boxes, ½ pound.....	15 c.
Boxes, ¼ pound.....	16 c.

These prices are subject to the following differentials:

	Extra.
5000 to 10,000 pounds.....	½c.
1000 to 5000 pounds.....	1 c.
500 to 1000 pounds.....	1½c.
Less than 500 pounds.....	2 c.

Oils.—*Linseed Oil.*—An advance has taken place in the price of City Oil of 2 cents, and in State and Western Oil of 1 to 1½ cents per gallon. The impression prevails among the trade that there is a surplus of Seed and Oil in the country controlled by strong interests, and that Seed values will be kept up to import prices. This state of affairs places the market in an unsettled condition. Buyers are ready to place contract orders for future delivery for State and Western Oil at 45 cents per gallon, but crushers will not accept business on that basis. New York quotations are as follows: City Raw, 47 to 48 cents per gallon, according to quantity; State and Western Raw, 45 cents for small lots, and from 46 to 46½ in large quantities. A further advance in price is not unlooked for.

Spirits Turpentine.—Sales at this point are confined to jobbing lots, in which a fair amount of spirits is changing hands. The market is a little stronger on advices from Southern markets of better business. New York quotations are as follows, according to quantity: Oil barrels, 54 to 54½ cents; machine made barrels, 54½ to 55 cents per gallon.

The Hardware and furniture business of J. T. Clough of Colorado Springs, Col., has been incorporated under the style of the John T. Clough Mercantile Company, with Mr. Clough as president. The company's lines include Shelf Hardware, Stoves and Tinware, Paints and Oils, Sporting Goods, furniture, carpets, &c.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses and are referred to the manufacturers:

FROM LYON & DAVIS, who have lately opened a Hardware and Stove business at Sidney, Ohio.

FROM PUTNAM HARDWARE COMPANY, Fairfield, Iowa, successor to the Fulton Hardware Company.

FROM H. M. CHATTERTON, Pittsford, Vt., who has lately purchased the Hardware, Implement, Paint and Sporting Goods business of S. K. Burbank. Mr. Chatterton expects to add plumbing to his other lines.

FROM McLAUGHLIN & SONS, Langford, S. D., who have bought out the Hardware, Stove, Paint and furniture business formerly carried on by Keller & Warren.

FROM BUTT HARDWARE COMPANY, North Platte, Neb., dealers in Hardware, Stoves, Paints, Sporting Goods, &c.

FROM KELLEY & DAUGHERTY, Clayton, Kan., who have lately succeeded Daugherty & Gregory in the general Hardware business.

FROM J. B. CHASTAIN & SONS, Bokchito, I. T., who are now carrying on the business formerly conducted by C. L. King.

FROM ALBERT L. LOUDERMILK, La Belle, Mo., who has recently commenced business as a retailer of Hardware, Stoves, Implements, Paints, &c.

FROM H. H. COOKE, Huntsville, Ohio, who has lately bought out the business of J. A. Coulter & Son.

FROM WHITE'S DEPARTMENT STORE, Logan, W. Va., which requests catalogues relating to builders' and general Hardware.

FROM T. S. CARTER HARDWARE COMPANY, Weatherford, Texas, which has succeeded to the business of J. R. Lewis & Co.

FROM HUGHES BROS., Meridian, Texas, who have purchased the Shelf and Heavy Hardware, Stove, Implement and Sporting Goods business of the Lomax Mercantile Company.

FROM CURTIS & EDWARDS, Alma Center, Wis., who have lately opened up in business, handling Hardware, both Shelf and Heavy, Stoves and Tinware, Implements, Paints, Sporting Goods, furniture, &c.

FROM W. FRAKER & SONS, Pompeii, Mich., who are successors to E. K. Barrus & Co. in the Hardware, Stove, Implement and Sporting Goods business.

FROM JONES & HELMICK, Gibson City, Ill., successors to E. C. Fundis, dealer in Hardware, Stoves and Sporting Goods.

FROM ZURMELY & JONES, Perryville, Ind., who have succeeded J. D. Bolla in the Hardware and Implement business.

FROM SPENCER & ELLSWORTH, Fort Scott, Kan., wholesale and retail Shelf and Heavy Hardware, Stoves, Tinware, Paints, Sporting Goods, &c., who have fitted up a new store.

FROM THE F. A. AMSDEN COMPANY, Deer Creek, O. T., dealer in Shelf Hardware, Paints and Oils, &c.

FROM H. D. THOMPSON, & Co., Malone, N. Y., who are intending to add to their complete line of Hardware a heating and plumbing department, and request catalogues

and quotations from manufacturers of supplies in this line.

FROM THE MILLIGAN HARDWARE & SUPPLY COMPANY, whose entire stock was destroyed by fire on the 28th ult. The company was amply covered by insurance and will resume business.

FROM THE SHEPHERD HARDWARE COMPANY, Lushton, Neb., which will about March 15 open up in the retail business in Shelf and Heavy Hardware, Sporting Goods, Harness, Stoves and Sheet Metal.

FROM SCHMIDT HARDWARE COMPANY, Sheffield, Iowa, which requests catalogues, especially from seed houses and manufacturers of incubators, two lines which the company is expecting to add to its business.

FROM ERICSON, MUNSON & Co., Bristow, Neb., successors to Ericson & Munson in the Hardware, Stove and Implement business.

FROM LAIRD BROS., Morland, Kan., who have succeeded Cain & Son in the general Hardware business.

FROM HICKMAN & MCOMBER, Vinita, I. T., who have recently purchased the Hardware, Stove and Sporting Goods business of G. W. Bates.

FROM J. F. SEATON, Richland, Iowa, who has bought the Hardware, Stove and Tinware business formerly conducted by Oscar Hinshaw.

FROM S. T. STEVENS & Co., Comstock, Neb., who have lately opened up as dealers in Shelf Hardware, Stoves, Paints, Sporting Goods and furniture.

FROM H. C. WALKER, Castle, I. T., who has succeeded R. S. Howeth in the Hardware, Stove, Implement, Paint, Sporting Goods and furniture business.

SIMMONS HARDWARE COMPANY'S BRANCH HOUSES.

SIMMONS HARDWARE COMPANY of St. Louis has purchased the entire stock on hand, fixtures and good will of the Nelson-Bouquet-Holliday Hardware Company, Minneapolis, Minn., and will assume charge very shortly. Matters will be got into shape for distribution of the company's goods from Minneapolis at as early a date as is consistent with due regard to proper service to customers. This will be another of the company's branch houses, supplementing those at Sioux City, Wichita and New York City. For the present the business at Minneapolis will be conducted under the style of the firm whose stock has just been acquired.

GOODSELL-PRATT COMPANY, manufacturer of Mechanics' Tools, Greenfield, Mass., has recently opened a store in London, where a complete stock of its products is carried at 149 Queen Victoria street. This new departure will enable the company to render more efficient service to its friends on the other side of the Atlantic. William M. Pratt, treasurer of the company and who is also a member of the Executive Committee of the American Hardware Manufacturers' Association, expects to sail for Europe for quite an extended trip on April 26.

BUFFALO WHOLESALE HARDWARE COMPANY, Buffalo, N. Y., which started in business two years ago with six traveling salesmen, has increased the force to fourteen, who are now regularly visiting the trade in the company's interest. This indicates the steady and healthful development of the business of the company, which is exclusively wholesale.

THE thirteenth annual meeting of the Hardware Club of New York City will be held on March 18 at the rooms of the corporation in the Postal Telegraph Building. The principal business of the meeting will be the election of five governors to serve for three years.

UNION HARDWARE & ELECTRICAL SUPPLY COMPANY.

UNION HARDWARE & ELECTRICAL SUPPLY COMPANY, Providence, R. I., which was established four years since and which has from the start steadily expanded its business until much larger quarters were rendered necessary to take proper care of its customers, took possession a few weeks since of its new building facing on Westminster street, and running back to Exchange place. The building is 200 feet long and 30 feet wide, four stories and basement, all occupied by the company. The arrangement of the new building is most complete and practical. The street floor is devoted to the retail department. Large double plate glass cases on both sides, the center of the store open and unobstructed, gives a very pleasing appearance to the interior. On the right upon entering is found the Cutlery line. Next in order follow the Sporting Goods. The Electrical Goods, a very large line of which is carried, come next, and toward the rear of the store on the right side is the Building Hardware. The rear of the store is arranged especially for the Paint and Oil business, this part of the business being steadily enlarged.

The large assortment of Mechanics' Tools is carried near the front of the store, opposite the Cutlery division, Carpenters' Tools, Jewelers' Tools and Shelf Hardware following in the order named. The arrangement of the store, the way stock is displayed and the light, bright effect throughout the store are noticeable. The second floor is devoted to offices, shipping rooms and stockroom; the third and fourth floors and the basement to wholesale stockrooms. The officers of the company are C. E. Angell, president; W. H. Angell, vice-president; H. L. Perkins, treasurer; W. L. Adams, secretary, these, together with F. S. Clark, C. E. Dudley and E. A. Smith, constituting the directors. The company is giving special attention to the development of the wholesale end of the business. Every convenience, including fast double elevator, telephones connecting all departments, &c., have been installed to facilitate the efficient handling of goods.

SHARING PROFITS WITH EMPLOYEES.

BUNTING-STONE HARDWARE COMPANY, Kansas City, Mo., has adopted the plan of an annual distribution of profits with employees which promises to prove satisfactory to all concerned. At the annual banquet given by the company to the employees, which was held the latter part of January, an announcement to this effect was made. It has been decided to make a distribution of 10 per cent. of the net earnings to the employees in the shape of a bonus, each person receiving his pro rata according to the amount of salary, no employee to be figured on a basis of less than \$10 per week, it matters not how unimportant his or her position may be.

Monthly dinners are also held throughout the year on the first Tuesday night of each month. This is to foster a stronger acquaintance between the company and employees, as well as to encourage suggestions pertaining to the betterment of the method of conducting business. Every one is asked and expected to talk at these meetings, giving the benefit of his information and ideas.

The company's experience has been that such an arrangement results in a better feeling, greater co-operation and more satisfactory results from every standpoint. It also serves to make each man feel personally interested in the welfare of the business, as employees will share in the distribution of profits just the same as stockholders. Doubtless this combined energy will produce better results to the employee and the company alike.

LYON, CONKLIN & Co., Baltimore, Md., have just taken possession of their new and commodious warehouse, 13, 15, 17 and 19 Balderston street, between Charles and Light. These premises put the firm in a better position than ever before to serve their customers.

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New York State Association of Retail Hardware Dealers.

(By Telegraph.)

THE careful and systematic arrangements for the meeting of the association, together with the active interest of the Buffalo manufacturers and merchants, bore fruit in what is undoubtedly in several respects the most successful gathering in the history of the organization. The officers of the association were on the ground early, and informal conferences on Monday evening and a more formal meeting on Tuesday morning got everything in readiness for a businesslike, well ordered convention. In all this much credit is due to John G. Ferres, the president, and to his associates and lieutenants.

Opening Session.

Shortly after 2 o'clock Tuesday the convention was called to order by the president, who, after a few graceful words of greeting, introduced Hon. Thomas Stoddart, who spoke in behalf of the Mayor, extending the hospitality of the city. He alluded to this as the age of associations and conventions, by which the best representatives of the various interests are brought together. As illustrating the growth of Buffalo, he referred to the fact that last year permits were issued for the erection of 2500 buildings, and touched also on the important place the city is taking as a manufacturing center. To the welcome thus extended the president made a felicitous reply.

After some announcements in regard to committees and entertainments, Mr. Ferres presented his annual report as given below:

A special committee was appointed to whom the report was referred that its various important recommendations might be referred to the appropriate committees later in the session. This committee reported assigning subjects to various committees, and commending the president's recommendations to the careful consideration of the delegates.

Discussion of trade topics was opened by R. R. Williams, Hardware Editor of *The Iron Age*, who touched upon some conditions and tendencies in the Hardware field and the opportunities and obligations by which the trade are confronted. Much to the regret of the association, W. P. Bogardus, president of the National Retail Hardware Dealers' Association, was unable to be present on account of illness in his family. He sent, however, a very interesting letter in regard to association work, which was listened to with close attention. A paper on credits, by A. E. Towne, who was unable to be present, was read by the secretary, and called out expressions of approval and appreciation. Mr. Towne's paper is given elsewhere. At the close of a very interesting session a number of merchants joined the association, there being during the year an important number of accessions to the membership.

Wednesday Morning Session.

Part of the Wednesday morning session was devoted to the representatives of manufacturers, who made brief addresses. In the absence of C. H. Miller, president of the National Hardware Mutual Fire Insurance Company, a most interesting address was made by W. P. Lewis, treasurer of the company, who, after touching upon association work in general, dwelt upon the importance of the fire insurance feature.

The Banquet.

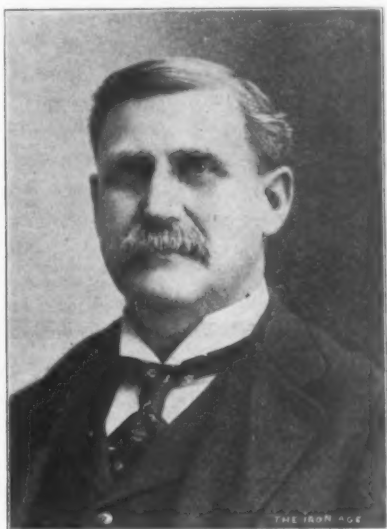
A banquet to the members and guests of the association was given on Tuesday evening by the manufacturers and wholesale merchants of Buffalo. After the dinner, which was enjoyed by about 250 persons, there was a varied programme, including singing, monologue and magic, after which E. C. Neal, acting as toastmaster, gave

the toast "Our Guests," which was very happily responded to by Sidney Detmers of Sidney Shepard & Co., to which J. G. Ferres replied in a brief and interesting address. In obedience to a call from the toastmaster R. R. Williams spoke, touching upon Hardware merchants' interests outside of business. A pleasant feature of the evening was the presentation to the guests of H. A. Hull, the first president of the association, who made a brief acknowledgment of the honor paid him and expressed his interest in the association. John D. Taylor, who was termed the father of the organization, was also introduced. The company, after singing "Auld Lang Syne," separated after a very enjoyable evening.

Presidential Address.

BY JOHN G. FERRES, JOHNSTOWN, N. Y.

This is practically a business meeting for business men, to exchange practical and tried plans and ideas, and to consider and devise methods that will improve and protect our business as retail Hardware dealers. Everyday business life reveals to us the fact that we are dependent on each other for protection, for trade, for pleasure, for happiness. In coming together at this time we vir-



J. G. FERRES.

tually—if not in words, by the act—indicate that we feel a mutual reliance, a fraternal feeling. We must stand and work together, earnestly and faithfully, to combat any and all encroachments and maintain and vindicate our right to exist as a separate and distinct trade, that of retail Hardware dealers.

ORGANIZATION.

This naturally leads us to the question, How is all this to be accomplished, what methods are we to inaugurate, what system to establish, that will bring us into closer relationship with each other, having, as it were, one object, one thought—protection to our business? It is fair to assume that every member of this association will agree that only by thorough organization and aggressive work can we wield the power and influence necessary to protect our trade and better its condition.

I believe that a great effort should be made to have dealers form local associations. By forming an offensive and defensive alliance they would be brought into closer relationship, learn what influences are at work to injure their trade, and, having frequent and regular meetings or conferences, would be thereby able to take prompt and concerted action on various matters in trade that we find oppressive and aggravating, and from which we now suffer for want of a good understanding with our neighbors. Quick information is needed in regard to interferences with our trade, and the local associations would be in position to examine into such matters at once, and if not able to bring about reform lay them before the

State Executive Committee, and if they are unsuccessful an appeal can then be made to the National Association, and the whole subject referred to them.

I am aware that it is a difficult matter for local dealers to come together of their own accord. There are old animosities, deep-seated resentments, but which are in the majority of cases purely imaginary, and I believe could be overcome by a friendly meeting and exchange of views. We therefore need an intermediary, some person who can devote his time constantly to association work. I submit to you that none of your officers is able to give the time and attention necessary to devise a plan or system to carry out this work. Therefore I present for your consideration the proposition to employ a competent person at a salary, whose business it would be to make a thorough canvass of the retail Hardware dealers, visit every dealer, no matter where located; solicit his membership, and carry out the work on lines similar to those that I have presented. In the performance of this duty he would constantly be in contact with dealers, exchanging views, hearing their complaints, giving advice, trying to heal differences between dealers, and would soon become so conversant with conditions in different localities that he would in a short time be able to render efficient aid, and you would soon be convinced that his services would be invaluable.

There is another thought in connection with the subject of organization, and which applies to retail dealers' associations generally, and also to our National Association, and I refer to it at this time for the reason that we have an official of the National Association present at this meeting: I believe that all the State associations should have a closer and more binding relationship; that we should be organized upon the plan of a federation or league, with the National Association as a grand or central body, and the State associations subordinate bodies, charters to be issued by the National to the State associations, and they in turn issue charters to local associations. There should be uniform constitutions and laws, each State association pledging loyalty to the national body. I am not prepared to go into the details, for the system would have to be worked out very carefully.

So important have I considered the matter of State organization that I appointed a special committee to consider the whole question and devise some plan that would be practical and that you would approve.

LEGISLATION.

Labor organizations have representatives at every session of our State Legislature urging the passing of bills in the interests of labor, and many oppressive laws have been made which would not have been the case if they had been looked after and opposed. A bill is now before the Legislature which is opposed by the labor representatives which permits a merchant to collect an honest debt. I refer to the garnishment bill, or, rather, an amendment to it reducing the amount of wages from \$20 to \$12, the minimum weekly income which may be attached for unpaid bills. Notwithstanding the opposition, the merchants made such a great effort that the bill passed the Assembly last Wednesday by a vote of 85 to 39. There is another bill before the Legislature proposing to tax trading stamp companies. It is now being revised by one of the best constitutional lawyers in the State, so that when it is reported it will be so framed that it will stand the test of the courts. When the bill is reported every dealer should make it his business to urge his Assemblyman and Senator to support it, for trading stamps are a nuisance. A Committee on Legislation would represent this association and at the proper time act on legislative matters that related to the retail trade.

CONSTITUTION AND BY-LAWS.

Our present constitution and by-laws were adopted at the first meeting of our association, held in Syracuse in 1902. The work was done rather hurriedly and a form of constitution and by-laws of some other association, with some slight changes, was adopted. It would seem, therefore, that after three years' experience some changes could be made that would be desirable and beneficial. The list of

committees could be enlarged and possibly the number of directors increased. By increasing your committees you divide the association work and a greater number are interested.

The committees recommended for your consideration provide for 39 members, in addition to the present officers and directors, making altogether 42 members who would be active and at work in the interest of our association between our annual meetings. My suggestion is that, excepting the Committee on Finance and Auditing and the Committee on Reception, a member of the Executive Committee should be chairman of each committee, in order that the Executive Committee would be at all times in touch with association affairs.

CATALOGUE HOUSE AND PARCELS POST BILL.

I will not take up your time by referring to the catalogue house question, or the Parcels Post bill, as the president of our National Association is present and at the proper time will speak to you upon both subjects in detail and also of the work of the Joint Committee.

JOBBERS OF HARDWARE IN NEW YORK STATE.

Generally speaking, I believe jobbers are taking a great interest in our association work and are doing all in their power to help us. I have before me a circular letter authorized and sent out by the New York State Jobbers' Association stating that they stand ready to assist us in every way possible to successfully meet the competition of the mail order houses. In this circular letter they offer some excellent suggestions to merchants to successfully meet this competition. They also offer to supply dealers with pamphlets for distribution among our customers, giving strong "reasons why your customers should patronize the home dealer instead of sending their cash to a distant city." These pamphlets they furnish without charge. It is very evident that the jobber realizes, as well as the retailer, that the mail order houses constitute desperate competition, and is aware that all goods sold by those houses represent a loss of profit to the jobber as well as to the retailer. I am extremely gratified that our friends the jobbers are working with us.

Credits—The Necessity of Curtailing Them.

BY ARTHUR E. TOWNE, SARATOGA SPRINGS, N. Y.

How to keep his business on a paying basis is the problem which confronts every merchant. This means a constant struggle with the leaks which drain away his profits. Most of these he has learned to control, but one of the largest and most troublesome of all he has not satisfactorily curtailed, and that is credits.

WHAT IS CREDIT?

Technically it is defined as "trust in the promise of an equivalent to be rendered at a future time for values immediately transferred." This element is of such scope that its influence is felt in every nook and corner of the business realm. Its various functions facilitate business operations, put money in circulation and set idle ability and idle capital in motion. On the other hand, it is so easily abused that it detracts much from its usefulness and is a source of worry as well as of loss.

STRICTLY CASH.

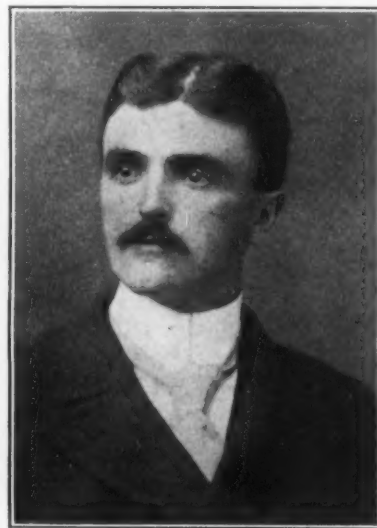
Merchants can make better prices for cash than for credit. The buying public knows this. Others using this fact for a foundation have built up enormous mercantile enterprises whose competition is felt throughout the country. I refer to catalogue houses and department stores. These institutions deal strictly for cash. With no part of their capital tied up in book accounts they always have ready money for the aggressive pushing forward of their business. By having many leaders they create for themselves enviable reputations as price makers.

How can merchants loaded down with a burden of credits expect to meet such competition? All that merchants have done so far to protect themselves is slight in comparison to what can be done by keeping their credits down to the lowest possible point, thus being able to go into the fight armed with their big competitors' most potent weapon.

ECONOMIC CRISES

occur at certain intervals. As a rule these make sad inroads upon the profits of the Hardwareman. It seems to be an established fact that the period of greatest prosperity is also the time when the volume of debt is greatest. Merchants relying upon the apparent prosperity of the country become less cautious than at other times and their book accounts pile up. The buying public goes into all kinds of speculations, and credit passes the point where there is sound value behind it. Values become greatly inflated. Finally comes the time to settle up. Demand diminishes, the markets become glutted, values shrink, men are out of work and debtors are unable to pay. Losses and bankruptcy follow. Then it is that the merchant finds a most disconcerting number of accounts on his books that will have to be charged up to profit and loss.

Wise is the Hardwareman who through it all has kept a strong hand on the credit end of his business. De-



ARTHUR E. TOWNE.

clines of values do him less harm and he is better equipped to meet business depression.

A HIGH COMMERCIAL CREDIT IS A MOST VALUABLE ASSET and it should be carefully guarded. To meet his bills promptly and to be good for whatever he buys is necessary to maintain the merchant's commercial character or credit; besides, it makes smooth many places that otherwise would be rough. Ability to pay is directly affected by the way goods are trusted out and collections made. It is imperative, then, to keep credits down and collections up, for it is easy for the merchant to get all his available cash on his books and thus diminish his ability to pay his debts.

CASH DISCOUNTS ADD SUBSTANTIALLY TO PROFITS.

Our surplus, thus loaned out, draws no interest, and, say what we will, our profits do not cover this loss in a satisfactory manner. Often the capital thus loaned out prevents the merchant discounting his bills, and the discounts, were he able to take them, would every year add substantially to his profits. Anything that will honorably build up our income is desirable and no way is easier or surer than by saving discounts. It takes cash to do it, and short book accounts and frequent settlements will help us to the cash.

Again, to curtail one's credits increases his profits, because the machinery of a credit system is expensive. This expense should be kept down by knowing who are good and limiting our credits to them. By good we mean not only those who are able to pay, but who will pay promptly. Very slow pay customers and those of doubtful financial ability we should rank very nearly in the same class as we do the deadbeats. The more we have of their accounts the more it costs to collect, and this expense must come out of our profits.

OVERZEALOUSNESS TO SECURE TRADE

and the consequent fear to say no put many bad accounts on our books. It is difficult to refuse to trust a customer who has spent more or less money in your store and who may also have brought you other trade, but if he is not deserving of credit he should be pleasantly but firmly refused, even if by so doing we lose him. Trust him, and sooner or later both customer and account are lost. There are a great many such people in every community, and their patronage is worth just as much as anybody else's so long as they pay. In our experience few customers are ever lost by refusing them credit. Here, then, is a reason for insisting on cash for the goods, as it seems to be the best, as it is the only profitable, way of holding this class of trade.

Slow pay customers are something the same, for when asked to settle they are very apt to leave us until such

would not make the Hardware business one "grand, sweet song," it would bring about a more satisfactory condition. If we cannot deal strictly for cash we can at least get close to it. Short credit can be insisted upon, and we can limit it to those who are good pay. To follow this out to the letter and at the same time push our business industriously and intelligently spells success.

SELLING STOVES ON INSTALLMENTS.

AT the annual convention of the Minnesota retail Hardware dealers, held at Duluth recently, Charles F. Ladner of St. Cloud told the association of his success in selling not only Stoves, but Cream Separators, Refrigerators and similar lines on installments. The form of note used by Mr. Ladner, which has been entirely

To _____ Township _____ County _____
Postoffice _____
Balance due, \$ _____

\$ _____ State of Minnesota, County _____ Town _____ Date _____ 19 _____
_____ months after date, for value received, we or either of us promise to pay to the order of
CHAS. F. LADNER _____ Dollars,
without discount or offset, and subject to the following conditions:
We the undersigned have this day purchased and received of party to whose order this note is made payable, one _____
_____ No _____, the price of the same being \$ _____ less \$ _____ paid in cash.
Now, therefore, in consideration of said _____ having been conveyed to us we have given this note to the order
of the party as above first named in the sum of \$ _____ payable in installments as follows: \$ _____ one month after date
\$ _____ two months after date; \$ _____ three months after date; \$ _____ four months after date; \$ _____ five months after date;
\$ _____ six months after date; \$ _____ seven months after date; \$ _____ eight months after date; if default be made in payment of any
installment, the whole amount of said note to immediately become due and payable. To secure this note we hereby sell and convey said
_____ to the party to whose order said note is made payable, upon the following conditions: That until breach
of any conditions herein named, said property is to remain in our possession, and possession is not to be parted with without written consent of the
holders of said note; and upon payment of the money as above specified, this instrument is to be null and void. In case default is made in the pay-
ment of said note or any installment thereof when due, then the holders of said note or any of their agents may enter our premises and take posses-
sion of said property and sell the same at private sale, and after applying the proceeds to pay said indebtedness, interest, and cost of sale, the sur-
plus, if any, to be paid to us.

WITNESS _____

time as they feel like paying. Thus their trade is lost in the meantime, if not altogether. Customers are occasionally lost, too, through disputed bills.

PROMOTES MISUNDERSTANDINGS.

Long credits are especially fruitful of misunderstandings. A customer forgets some of the items and insists he has never had them, and he expects you to accept his indistinct recollection in place of the record of your carefully kept books. You may lose him by insisting on settlement according to the bill, but if every point the customer disputes is allowed a bad precedent is established which is both troublesome and expensive.

CULTIVATE THOSE WHO PAY.

They remain one's customers and friends. Of all those who deal with us they are most easily pleased. They are the principal ones whose kindly recommendations bring us new trade. They are not the ones who accuse us of trickery and dishonesty. They are not the ones who put us off month after month on their accounts, using their available money in the meantime to pay for more or less large bills of goods bought from catalogue houses.

Over the credit department a strict supervision should be maintained. All those to whom credit is to be extended should be carefully investigated. Do not stop when a man is found to be able to pay. Learn what are his personal characteristics. Is he dishonest? Does he drink? Is he a gambler? If so, put a limit on his account. Does he entertain his friends lavishly at some fashionable club? Do not take such a man's standing for granted. Things are not always what they seem. Look him up carefully. The distance from the "giddy whirl of fashion" to the bankruptcy court is short. If your local business man's association is up to date it has a booklet which will tell you something about the standing of every one who buys goods in your town. Get a copy of that booklet and use it. Use your judgment, too.

CUT CREDITS SHORT AS POSSIBLE.

A strictly cash business, were it possible, would relieve us of our greatest source of loss, and though it

successful and which evidently conforms to State laws,
is shown herewith.

The interest manifested by dealers was so keen and so many of them had unhappy experiences with notes that were not properly worded that we publish the wording of Mr. Ladner's note with his permission for the benefit of the Hardware trade in general.

A CORRESPONDENT in that country advises us that the customs authorities are very strict in Australia just now, and that American exporters not familiar with the Australian market would do well to furnish a detailed statement of the contents of any package along with the dispatch advice to the consignee. This precaution will save considerable delay at this end in clearing. In quoting to Australia manufacturers should be familiar with rates of freights, duties, &c., so as to be able to quote prices c.i.f. Australia, rather than f.o.b. their own city. Catalogues and other printed matter are subject to 3 pence per pound duty.

WILLIAM H. COLE, who has a wide acquaintance with the Hardware trade, has become a member of the firm of Bell & Cole, 52 Broadway, New York. The business of this firm, besides incorporating companies, financing industrials, disposing of patents and securities, is to buy, sell and lease real estate, manage estates, appraise property, &c.

Bernard S. Schmehl of the firm of Scheidt & Schmehl, Lake Odessa, Mich, has disposed of his interest in the general Hardware and Stove business to his partner, James S. Scheidt, who will continue under his own name. Mr. Schmehl has accepted a lucrative position with Holten & Collins Company, 509 Ludlow street, Philadelphia, Pa., manufacturer of insulating paper, wrapping, building and roofing paper, &c.

T. C. Cole Hardware Company has purchased the business formerly carried on by Hugh McCredie, Oklahoma City, O. T.

Parcels Post Defeated.

WASHINGTON, D. C., March 7, 1905.

EVERY parcels post amendment offered to the Post Office appropriation bill was defeated during the closing hours of the session that terminated at noon on the 4th inst., and the Fifty-eighth Congress expired with a clean record as far as this populist legislation is concerned. The outcome cannot fail to be highly gratifying to retail dealers in all lines, but it is only fair to state that a large measure of credit is due to the members of the various retail Hardware associations, who, at the most opportune moment, filed their telegraphic protests against the pending measures and were largely instrumental in bringing about their rejection.

As stated in this correspondence last week, the Senate Committee on Post Offices and Post Roads added two important amendments to the annual Post Office appropriation bill in the form of new sections, one of which provided for a reduction from 16 to 8 cents per pound in the rate on pound packages of merchandise, while the other embodied General Bristow's plan of a 3-cent rate on packages up to 5 pounds in weight, transported over rural routes exclusively. There has been some difference of opinion as to the merits of the latter proposition, which, it can be said, was conceived by General Bristow in the interest of local retailers. As to the amendment providing for a reduction in the rate on pound packages there could be no possible doubt that it was simply an entering wedge for a domestic parcels post.

One of the most consistent and energetic opponents of domestic parcels post schemes of all kinds is Representative Hedge of Iowa, who for many years has been a member of the House Post Office Committee. When he learned that these amendments had been reported to the Senate he promptly conferred with his Senatorial colleague from Iowa, Senator Dolliver, a member of the Senate Post Office Committee, to whom he explained the character and probable scope of the amendments. Mr. Dolliver was quick to see the advantage that would be given the catalogue houses and the consequent injury that would be suffered by retailers as the result of the proposed reduction of the rate of postage on pound packages, and when the bill was taken up for passage in the Senate he made the point of order against this amendment that it was "new and general legislation," which, under the rules of the Senate, cannot be added to an appropriation bill except by unanimous consent. Senator Penrose, chairman of the Post Office Committee, had by this time received more than a score of vigorous telegraphic protests against this provision from Hardware and other retail interests and made no attempt to influence the ruling of the chair, which promptly sustained Senator Dolliver's point of order, by which the obnoxious amendment was ruled out of the bill.

The Senate thereupon took up the committee's amendment embodying General Bristow's plan for a cheap local package delivery on rural routes. In reply to inquiries as to the purpose of this amendment and its probable effect, Senator Penrose read the following statement from a letter addressed to the committee by General Bristow's successor:

With the establishment of rural delivery and the increasing extension of rural telephone service by private interests there has grown up a demand by the patrons of the rural service for the delivery of small packages of merchandise, such as food-stuffs, tobacco, dry goods, drugs, &c., on an order to the local merchant by postal card, telephone or otherwise. The value of these packages of merchandise is usually small, and the present rate of postage of 1 cent per ounce is practically prohibitive. The patron or merchant cannot afford to pay 16 cents for the delivery of a pound of coffee or tobacco or similar article, but if a special rate were established on such matter from the distributing office for delivery to any patron on the rural routes from that office, or for delivery in the office from a patron on the route, it would be a great convenience to the patrons and become a source of revenue to the Department.

This will be accomplished by fixing a rate of 3 cents per pound or any fractional part thereof on packages of books or merchandise not exceeding five pounds. The carrying of such matter at a rate of 3 cents per pound would be remunerative, for the reason that there would be no added expense, inasmuch

as it is expressly provided that such rate shall not apply to the transmission of mail matter from one office to another, and there is, therefore, no additional expense for railroad transportation. This provision does not contemplate the admission to the mails of any matter which is not now admitted.

Senator Lodge had reserved the point of order against the Bristow amendment, but after hearing the explanation of the Post Office Department he refrained from pressing it, and the Senate agreed to the change. The bill was then passed and referred to the Conference Committee composed of Senators Penrose, Dolliver and Clay, and Representatives Overstreet, Gardner and Moon.

The conferees spent several hours in the work of harmonizing the difference between the Senate and House regarding the appropriation bill, and a considerable portion of this time was given to discussing the Bristow amendment. The Senate conferees were disposed to retain the provision on the ground that instead of being in any sense a parcels post provision, costly to the Government and injurious to retail interests, it embodied an effective method of securing several millions additional revenue and at the same time provided an agency by which local retailers could deliver their goods to their customers on rural routes. It was further pointed out that the mail order houses could not utilize this service, as it would be limited to packages deposited at the offices from which rural routes radiate. The House conferees, however, asserted that, without regard to the question of revenue or advantages that might accrue to retailers, the adoption of the amendment would be a long step toward a domestic parcels post. It was further urged, also, that the big catalogue houses would be able to utilize such a service by shipping goods in bulk by freight to distributing offices and having deliveries made over the rural routes at the 3-cent rate. The Senate conferees finally yielded the point and the amendment was abandoned. The bill, therefore, as signed by the President was shorn of every parcels post project and the work of the Postal Progress League and other organizations with similar aims has again come to naught.

Parcels Post Crusade Will Go On.

The retail Hardware trade should understand, however, that the campaign for a domestic parcels post will not be abandoned because of these measures. The fight will go on and there is much to be done without delay by those who oppose these schemes. More than 100 new members of Congress will take their seats when the House reconvenes—probably in extra session next October—and the Congressional recess will afford an excellent opportunity for retailers and their friends to acquaint their respective Congressmen with their views concerning all these projects.

The most dangerous measure brought forward in several years is the proposed consolidation of third and fourth class mail matter. It has the support of the Post Office Department for purely administrative reasons, and chiefly because certain patrons of the mails occasionally find some difficulty in distinguishing between merchandise and printed matter in the case of calendars, samples, &c. Representative Hedge calculates that on the basis of the amount of fourth-class matter now carried in the mails such consolidation would result in a loss of more than \$2,000,000 per annum, which would have to be met by the general taxpayers, chiefly for the benefit of half a dozen catalogue houses. Of course, these concerns will not be idle, and as a full fledged domestic parcels post seems a good way off, they can be relied upon to co-operate with the Post Office Department in every possible way in bringing about this consolidation. The Hardware retailers alone are strong enough, if they will exert themselves, to control the sentiment of Congress on this subject, but energetic work will be required and it cannot be too promptly undertaken.

W. L. C.

Skandia Hardware Company, Rockford, Ill., wholesale and retail, has purchased property immediately adjoining its establishment on the north and will build a storage room 20 x 70 feet as soon as the weather permits. The company's business has been increasing to such an extent as to require this enlargement of its facilities.

HARDWARE TRADE OF THE MEDITERRANEAN

FROM A SPECIAL CORRESPONDENT.

IT is almost piteous to listen to the representations of American travelers concerning the openings for American trade abroad, backed up as they are by the urgent appeals of our Consuls at the Mediterranean ports to send out agents and samples, and to notice how little response is made to them by our manufacturers and dealers. Circulars are of little use; few foreigners can read them, and fewer still will order the goods offered without seeing samples. The great need is experienced commercial travelers with full lines of samples. The Consul at Harput says that \$10,000 to \$20,000 a year of American Sewing Machines are sold in his district, and he calls for American Bicycles, Wind Mills, Tools, Builders' Hardware, Machinery and Saddlery. The Consul at Smyrna says that a single commercial traveler from the United States sold \$65,000 in two or three months. The Consul at Malta calls for American Hardware of all kinds, specifying Locks, Cutlery, Fishing Tackle, Fish Hooks, Brushes and Brooms. The Consul at Beyrout calls for Wind Mills, Threshing Machines, Oil Motors, Plows, Hay Rakes, Mowers, Forks, Hoes, Harrows, Land Rollers, Cultivators, Pumps, Farm Wagons and Petroleum Engines; and says that 37 Reaping Machines were sold in a few weeks by an American traveler in a single obscure Syrian locality.

Eager Demand for American Hardware.

A similar condition of affairs prevails in all the Mediterranean and Black Sea ports, from Gibraltar to Trebizond. All these places have sent emigrants to the United States, and these people have written home describing the advantages of American labor saving tools and devices, so that the entire littoral of these two seas is eager to purchase similar ones. A commercial traveler recently returned from Trebizond says he took \$120,000 in orders during a three months' trip. There is also a big trade in Hardware Specialties to be done at certain of the Spanish ports; but as there are peculiarities in this trade which cannot be discussed and provided for, unless both parties can come to a complete and perfect understanding, it is necessary that the American representative of the goods should have not merely a superficial but an intimate knowledge of the Spanish idiom. He should also be familiar with the way in which the business is now done with England; how the goods are to be packed and how shipped; for in all these details there are peculiarities known only to the initiated. The confidence in American goods is everywhere unbounded. When American goods can be obtained, they are easily sold in preference to similar articles made in Great Britain, Germany or France. This is not due merely to their superiority; it is partly due to the preference of the successful emigrant who has written home about them.

Response to the Demand.

The response to this demand has not equaled it in generosity. Our export trade in Hardware is large and has been continually growing, but unless the consuls are out of their senses and the travelers have drawn a very long bow, neither of which hypotheses is credible, the trade could be greatly and at once increased by a little more exertion on the part of our manufacturers and dealers. During the calendar year ended December 31, 1904, we exported Iron and Steel manufactures, Vehicles and Agricultural Implements of domestic manufacture to the value of about \$140,000,000, or an average of \$11,750,000 a month. This does not include Porto Rico. With anything like pushing on the part of our manufacturers and dealers, this average could easily have been increased to \$12,500,000 a month, or \$150,000,000 for the year. Of five classes of Hardware alone we exported during the year \$135,000,000 worth. These were Agricultural Implements, Carriages, Bicycles, Builders' Hardware, Cutlery, Firearms, Tools, Nails, Wire, Typewriters, Sewing Machines and small manufactures and machines. With such a large and eager trade there ought not to be a single workshop idle or a single workman unemployed in our land.

How to Push the Trade.

There is no necessity in the foreign trade, as in the domestic trade, to spend large sums of money in creating a demand for goods; the demand exists already. Nor is it worth while, for the reason already given, to send circulars and price-lists. This kind of advertising can best be done through a trade journal that goes to the principal consulates and commission and purchasing houses abroad. When practicable, the advertisement should be illustrated with cuts of the article offered for sale; the larger and more perfect the cut the better. Then follow this up with a good traveling agent, armed with a full set of samples and clothed with some discretionary authority as to modifications of type and also as to modes and ports of consignment, this latter being of much greater importance in the Spanish, Turkish and other Levant trades than is commonly supposed. An experienced agent thus equipped can sell more goods in the Mediterranean in a given time than several men in the well beaten tracks of domestic commerce. Moreover, the profits are often greater and the trade is always more permanent.

It is a great source of gratification to be able to chronicle such a condition of trade—large and increasing exports and an eager demand for our goods, not only in Europe and South America, but also in regions where but a few years ago American Hardware was entirely unknown.

TRADE ITEMS.

H. BERKELE, 29 Murray street, New York, has been appointed city salesman by the Geneva Cutlery Company, Geneva, N. Y., for the marketing in this territory of its Razor product. The company manufactures a complete line of full concave, three-quarter and one-half concave sizes in $\frac{3}{4}$, $\frac{5}{8}$ and $\frac{1}{2}$ inch blades, which are hand forged from Kayser, Ellison & Co.'s Sheffield steel and fully warranted. A large line is made, covering a great variety of styles and finishes.

THE H. B. IVES COMPANY, New Haven, Conn., manufacturer of Builders' Hardware Specialties, has recently purchased of the Connecticut Mfg. Company, also of New Haven, its Trolley Wheel and Bushing business, which includes a line of special machinery for the manufacture of this class of goods. This branch of business will be associated with the Ives Company's already extensive line of Electric Car Fixtures and Trimmings, for which the Recording Fare Register Company, New Haven, Conn., is selling agent.

AN example of how enterprising manufacturers are making it as easy as possible for dealers and users to handle manufactured products, especially in instances where some thought or experience in connection with a particular article is required, is afforded by the working details prepared by the Tabor Sash Company, Newark, N. J., applicable to its revolving and removable Sash. For the information and convenience of the contractor or carpenter the company issues elaborate working plans on sheets of thin, strong paper, each 20 x 24 inches, in a Manila covering and stapled at top to hang. They comprise complete drawings on a large scale, with descriptive matter showing plainly how to hang any of the A to J styles of sash. One of these hangers is sent with each order, so that a competent workman can readily fit this form of construction without previous knowledge of its peculiarities.

THE PROGRESSIVE MFG. COMPANY, Torrington, Conn., has recently purchased from the Bridgeport Gun Implement Company, Bridgeport, Conn., the Forstner Brace and Machine Bit business, including machinery, stock, manufactured parts, good will, &c. The Progressive Company is now manufacturing these Bits at its factory at Torrington, where all requests for prices, &c., should be addressed.

Doolittle Bros. Company, Painesville, Ohio, is enlarging its store to meet the demands of increasing trade. A new front is being installed, as well as new store fixtures.

AMONG THE HARDWARE TRADE.

Messrs. Selvidge and Fischer have purchased Henry T. Davis' interest in the Billings Hardware Company, Billings, Mont., wholesale and retail Hardware, Stoves, Tinware, Sporting Goods, &c. The company has recently added to its lines crockery and plumbing and heating.

H. R. Brassfield & Co., Hardware and furniture, Unionville, Mo., have been succeeded by Comstock-Brassfield Mercantile Company, dealer in Shelf and Heavy Hardware, Stoves, Implements, Paints, Sporting Goods, Buggies and Wagons, Furniture, Lumber, Saddlery, Harness, &c. Mr. Brassfield had been in business for 22 years and sold out on account of ill health.

The Lyon Hardware Company, Springfield, Ohio, which has conducted business on East Main street for the past 14 years under the form of a partnership, has been incorporated as a stock company. Geo. H. Eberle and U. H. Gurnea were the former partners, and in addition to these the new company comprises E. C. Gwynn, president of the Safety Emery Wheel Company; C. H. Pearce, formerly of the Pearce Book Company, and F. A. Rice, Frank H. Credel and Herbert Sawyer, young business men of the city. Mr. Gurnea is president and general manager; Mr. Eberle, vice-president, and Mr. Sawyer, secretary and treasurer.

Zeman & Stangel Company, Manitowoc, Wis., has been incorporated with a capital of \$30,000, to carry on the wholesale and retail business in General Hardware.

T. W. O'Laughlin has succeeded O'Laughlin & Weible, Friend, Neb., in the Hardware, Stove, Implement, Paint, Sporting Goods and furniture business.

Harrison Bros. have purchased the Hardware store at Manchester, Va., formerly conducted by Charles Friend. The old line carried embraced Hardware, Stoves and Agricultural Implements, to which Paints, Oils, &c., have been added by the new proprietors.

Blodgett & Blodgett have succeeded H. J. Flock in the Hardware, Stove, Paint and Sporting Goods business, Sterling, Ill.

Ella F. Clark, Harry P. Oldham and John S. Ranahan, comprising the firms of Oldham & Ranahan and Estate of William H. Clark, have consolidated their interests under the name of Oldham & Ranahan Company, which will continue the general Hardware, plumbing, steam and hot water heating and sheet metal work business.

The Wittich Hardware Company has disposed of its stock in Larned, Kan., to the Morris Hardware Company, which will continue at the old stand.

A. F. Hitchcock has succeeded Hitchcock & Hamilton in the Hardware, Stove, Implement, Paint, Sporting Goods and furniture business at Panama, Neb.

Burry & Markel, dealers in Hardware, Evans City, Pa., have disposed of their business to the Burry & Markel Company. The new company will be in the hands of those who managed the affairs of the old firm. The officers are: L. M. Burry, president; H. H. Beighlea, vice-president; Daniel Markel, treasurer, and L. O. Markel, secretary.

W. D. Beyrer has sold a half interest in his Hardware, Stove, Implement, Paint and Harness business in Bertrand, Neb., to O. H. Dressler, and the style has become Beyrer & Dressler.

Harry V. Huston has bought the Wilcox Estate Hardware stock, Ludington, Mich., and will continue the business at the former stand, which will be remodeled and rearranged.

A. C. Blake has severed his connection with Munro, Blake & Haskell, Whatcom, Wash., and has re-entered

business at South Bellingham, buying out the stock formerly owned by G. A. McIntosh. Mr. Blake, who is well known to the trade of the State from his former connection with the Washington Hardware Association as secretary, has incorporated under the style of the Blake Hardware Company and opened up for business on the 11th ult.

A. E. Swift has bought out the Hardware and furniture business formerly conducted by F. S. Dowell, Coin, Iowa.

The Smith & Winchester Hardware Company, Jackson, Mich., has been succeeded by the Smith-Winchester Company, which has been incorporated with the following officers: H. L. Smith, president; R. W. Smith, vice-president; S. H. Winchester, treasurer, and W. B. Osborne, secretary. In the reorganization the old employees of the company have become interested as stockholders, putting the business on something of a profit sharing basis.

J. C. Walters & Co. have succeeded J. C. Walters in the Hardware and Implement business at Dysart, Iowa.

The Orcutt Company, Sioux City, Iowa, which has been in business in that place for the past 14 years, has purchased a site on Nebraska street, between Third and Fourth, on which it will erect a fine building for its general Hardware business.

Bischoff & Bro., dealers in Hardware, Stoves, Tinware &c., Granite City, Ill., have dissolved partnership by mutual consent. H. H. Bischoff Hardware Company is successor at the old stand.

M. Eberhart & Son Company has taken over the Hardware, Tool and Supply business formerly conducted by M. Eberhart & Son, First avenue and Seventy-sixth street, New York City. The officers of the new company are Markus Eberhart, president; Charles Eberhart, vice-president, and Marcus Eberhart, treasurer. The plumbing business heretofore conducted by Frank Eberhart will continue as a separate interest.

A new Hardware store has been established at De Smet, S. D., by the Robinson Company. Wm. Robinson will manage the business.

Hurdland Hardware Company, Hurdland, Mo., has succeeded the Metz-Chadwick Lumber & Hardware Company. Harness has been added to the lines formerly carried.

Stedronsky Bros., Wagner, S. D., have purchased the Hardware store of W. B. Gilreath at Lake Andes. The business will be conducted as a branch.

At Wessington, S. D., H. Gorman has purchased the interest of J. D. McNair in the Hardware business, and it is understood the business will in future be conducted by the firm of Safford & Gorman.

McGuire & Hulsebus, Defiance, Ohio, have disposed of their Harness department and will hereafter devote their attention exclusively to the sale of Hardware and Furniture.

F. L. Ernst has lately embarked in the general Hardware business at Humboldt, Neb.

Wm. B. Wood, Hurley, S. D., has disposed of his Hardware and Farm Machinery business to Bradberry Bros. Mr. Wood was compelled to retire from business on account of failing health.

The Stutzman Hardware Company is successor to the Steel Hardware Company at Buda, Ill.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

CATALOGUE HOUSE COMPETITION.

Various Suggestions Upon the Successful Combating of Mail Order Houses Which Are Cutting into the Local Hardware Trade.

BY CLARFIELD.

IN a recent issue of *The Iron Age* a Western merchant outlines a plan for meeting the competition of catalogue houses. He tells how a certain few articles are selected each week and advertised at prices as low as, or lower than, those quoted by the mail order firms on the same articles. The names of several of the mail order houses are published, with comparative prices, to prove that the goods can be bought locally to better advantage than by sending into the outside market. The attention of the public is called to the fact that freight and express charges are sometimes saved by buying at home, while the home price is never higher than the catalogue house price with transportation charges added. The customer also has the decided advantage of selecting directly from a variety of goods instead of choosing from catalogue illustrations and descriptions.

This is straight from the shoulder. It is a blow that is bound to tell every time it lands, and it will land every time the plan is carefully and conscientiously carried out.

Advertising Competitors.

But why is it necessary to publish the names of the competitors? Every time their names are mentioned it means publicity for them. It means the bringing of these concerns before the public eye directly in an announcement calculated to meet their competition and defeat their objects.

It does not pay to spend good, hard earned dollars for advertising space in which to mention competitors. Catalogue competition can be met without doing it. If the local merchant is a persistent and careful advertiser, he will be so closely in touch with his business that his advertised prices will always be as low as, or lower than, his competitors', no matter whether they are in his own town or out of it.

Troublesome Picture Advertising.

There are other difficult obstacles in this connection to overcome. One of them is this: The catalogue man is advertising goods by picture, price and description, while the local merchant must always back up his announcements by showing the goods in his store. The picture of a dollar Chisel cannot be made to look very much different from one worth only 50 cents.

There's where the rub comes.

A catalogue house may advertise an article in a thoroughly honest manner, and yet give out the impression that the article is very much better than it really is. This is a handicap for the local merchant, for the Chisel shown in the pages of the catalogue often looks as good as the one the local man offers for 50 per cent. more.

A Matter for Investigation.

Still, the catalogue houses cannot do a profitable business by misrepresentation. The managers of these great institutions know this thoroughly. They are getting nearer and nearer to real facts every day. If they depended entirely upon their first orders from the catalogue they would go into bankruptcy. It stands to reason that they cannot get second or third orders unless the first ones turn out to be very nearly as represented.

In spite of all this, it is very often true that the corners have been trimmed off from the cost of catalogue goods in some way or other before they are sent out into competition in the open market. This may be done in a way which does not injure the articles for practical use, yet it brings them down to a price which would mean ruination to a local Hardwareman with a spick-span stock of first-class merchandise.

It pays to buy these goods and investigate them carefully. They may be of such a nature that it would not pay for the local man to have them in his store for sale. It will pay him handsomely, though, to have a sample in his store which he can show to mechanics, and explain that this is the exact article which Highroller & Co. advertise in their catalogue at a cut price. If the mechanic wants it, it is an easy matter for the Hardwareman to get it for him, but when the craftsman sees it the chances are about a hundred to one that he will not want it.

On the other hand, when the article is reduced in cost in a manner which does not interfere with its practical use, or if it has been produced by a firm with which the local man has been unfamiliar, it may prove greatly to his advantage to buy it and carry it in stock.

Not Thorough Enough.

The great trouble with local Hardware merchants is that they are not thorough enough in such matters as this. They do not keep themselves well enough informed along these lines, and it is a rattling good thing that *The Iron Age* has begun an agitation of this subject for the benefit of the Hardware retailer. It may interest many local merchants to know that the one offering these few suggestions feels pretty sure of the stand that he takes. He is positive that if the local man will be up and doing and take advantage of his opportunities he will find the meeting of catalogue house competition entirely within his power.

The writer has had experience on both sides of the fence.

A HOLIDAY WINDOW DISPLAY.

STUMP & MUELLER, Marietta, Pa., dealers in Hardware, Stoves, Ranges, Kitchen Utensils, &c.; also roofing, plumbing, hot water and steam heating, originated



A Holiday Window Display.

the show window display for the holiday season as here reproduced. The central idea was to impress on the public that they were offering good merchandise at moderate prices. This idea is expressed in the sign, "This is the place to buy your holiday goods; I have put out high prices," and signed "Santa Claus." To make it more realistic, the words "high prices" were partly burned. The entire display was made up of goods out of stock, a Milk Can for boiler, Bread Pan for ash and coal box, Tobacco Sprayer for pistons, Dinner Bucket, Wash Basins and Dust Pans for seat and foot rests. For Water nozzle a Blow Horn was used, other parts being Washing Machine Wheel, Scythes, Express Wagon Wheels, Pipe Fittings and Valves, Garden Hose, &c. Santa Claus was made of two Tin Buckets for body, two Pudding Pans for Head, Coffee Pot Spouts for nose, Screw Tops for eyes, Scoops for fireman's hat and Hemp for hair. The legs and arms were made of Bent Tin Spouting, with hands of Garden Weeders. This ingenious display was arranged by James Caracher, and attracted much attention.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NORFOLK STREET, LONDON, W. C.

The Week's Hardware Trade.

IN the Hardware and light trades there is a slight improvement in the volume of work as compared with a year ago, and there is a fairly good consumption of raw material, but the trade cannot yet be described as good. The unsettlement due to the recent advance in the price of copper still exercises a detrimental effect, and while there has been this slight improvement in volume of business there are still complaints concerning its unprofitableness. Engineering also, though started on the upward track, has still much ground to recover before retrieving that which was lost last year. The demand for Edge Tools remains quiet, and for Nuts, Bolts and Nails merely moderate, but Hollow Ware shows a tendency to improve. There are, however, influences at work which tend to disturb this latter industry. The slackness of the winter has been taken advantage of by the officials of the Iron Plate Workers' Union to push forward an attempt to strengthen their organization, which had become very slack. Makers of Galvanized Wire Netting, influenced largely by dear spelter, have notified a reduction in discounts which is equal to an advance of 10 per cent. on the net in the case of small parcels and of 5 per cent. for larger orders. A fair trade, which shows some improvement on this time last year, is being done in the general range of ironmongery goods, but manufacturers still complain that business is not sufficiently brisk.

Cutlery and Hardware in India.

I would like to draw the attention of exporters to the increasing trade done by India in Cutlery and Hardware. During the last nine years the value has increased by nearly 75 per cent. The imports during the past two years were as follows:

	1902-3.	1903-4.
Cutlery	£84,526	£83,699
Agricultural Implements	51,595	49,212
Other Implements and Tools	72,412	74,452
Enameled Ironware	54,291	120,880
Sewing Machines	46,894	67,230
Unspecified Hardware	1,023,068	1,156,410

The first among the enumerated articles is Enameled Ware, of which 80 per cent. was received from Austria-Hungary and nearly 14 per cent. from Germany; but more than three-quarters of the whole is under the head of "Unspecified Hardware." The share of Continental goods, mostly from Germany, Austria-Hungary and Belgium, rose somewhat to 26 per cent., which is but little above the average of recent years. British goods, on the other hand, which are of superior quality and consequently dearer, did not show the same proportionate advance and their share fell from nearly 70 to 64.7 per cent. of the whole. The advance under other countries is mainly due to imports of Hardware to the value of £40,000 from the United States and £48,000 from Russia.

Pumps in South Africa.

I extract the following from a report sent by the British agent at Thabanchu, Orange River Colony. It contains some hints worth taking:

British manufacturers should look out for orders for pumping plants. The Government are realizing every day the necessity for boring for water as much as possible, and the Land Settlement Department are offering Drills at low hire to settlers and have lately bought six new Juniper Drills, which are being operated with as fast as possible. As in many or most instances the water when found does not run out, and cannot be furrowed out, it is necessary to use a deep well pump, with either steam, oil, wind or horse power. Wind mills seem to be the most economical and favorite form of power. . . . The Americans are in the field with both Mills and Pumps. . . . Orders do not come nowadays to the man in the office, but to the man who, by push and courtesy combined, can personally prove the efficacy of the goods he represents.

Looking Toward the English Market.

During the past few weeks an unusually large number of representatives of American houses have been visiting England with a view to opening up trade. I take this to mean that the trend of affairs in America indicates increased capacity again to undertake British business. I have this week met three American pioneers,

each of whom was prospecting the country with a view to introducing their goods. I hear also from various agents that there is a greater readiness on the part of American exporters to enter into agreements and to promise supplies. During the past two years there has been a complete absence of any such disposition, so that it may well be that by next autumn there will be an increasing volume of manufactured exports from the United States. I would merely express the hope that those American houses that are now starting connections over here will realize the importance of cultivating them assiduously, and not merely making a convenience of them when trade is slack at home. Regularity of supply is assuredly one of the essentials of successful business in this country.

I would venture a hint to firms sending pioneers over here. The home trade and the shipping trade are quite different propositions. It is not always easy for a British agent to cultivate both trades, although some of them do it, and with success. I would therefore urge visitors over here not to forget the great shipping interests and to see to it that the export department is not overlooked. Doubtless it is worth while to cultivate the British connection pure and simple, but if a man travels all this distance from America to England he might as well kill two birds with one stone, and, while securing British business, secure connections in Europe and the British colonies.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

SAWYER TOOL MFG. COMPANY, Fitchburg, Mass.: Six-page leaflet showing new line of friction joint Outside, Inside and Hermaphrodite Calipers, one-inch Rule with Holder and assortment of 24 Nail Sets in block.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Illustrated cloth bound catalogue No. 465 of 100 pages devoted principally to Bicycles, Sundries and Accessories. Also catalogue No. 466 of about 250 pages describing Fishing Tackle, Baseball, Tennis and Athletic Goods. A third catalogue relates to Baby Carriages, Go Carts, Refrigerators, Baskets, &c.

OAKMAN BROS. COMPANY, 45 Murray street, New York: Illustrated catalogue No. 2 of Paper Hangers' Tools and Supplies, including Putty Knives, Molding and Cabinet Scrapers, Glaziers' Points and Driving Tool, Spatulas, Palette Knives, Base Trimmers, Seam and Smoothing Rollers, Knives, Shears and various kindred goods handled by it.

CORBURN TROLLEY TRACK MFG. COMPANY, Holyoke, Mass.: No. 22 Ladder catalogue relating to Patent Rolling Ladders, illustrating 10 styles.

BRUCE & COOK, 188-190 Water street, New York, dealers in Metals and Metal Workers' Supplies: Yearly calendar for 1905 similar to that of previous years.

THE STANLEY WORKS, New Britain, Conn., and 79 Chambers street, New York: A handsome hanger calendar in colors, 25 x 13 inches.

BRAUNSDORF-MUELLER COMPANY, Elizabeth, N. J.: Illustrated and descriptive catalogue of Dorn's Patent Revolving Miter Box.

GRAND RAPIDS FIXTURES COMPANY, Grand Rapids, Mich.: Illustrated catalogue F. of combination Showcases in a large variety of handsome styles, many of which are glass on four sides and top.

THE ERIE SPECIALTY COMPANY, Erie, Pa.: Illustrated descriptive catalogue of 68 pages of specialties in Hardware, Soda Fountain and Advertising Novelties, including Cork Pullers and Cork Screws in exhaustive variety, Stopper Lifters, Ice Picks, Lemon Squeezers, Fruit Press,

Chill Shakers and Beverage Mixers, Ice Shaves, Potato Mashers, Cream Dishes, Soda Spoons and Cigar Cutters and Lighters.

THE ROOT BROTHERS COMPANY, Plymouth, Ohio: Illustrated 40-page catalogue and price-list No. 12 of Hardware Specialties, such as numerous outfits complete for repairing Boots, Shoes, Rubber, Harness, &c., Lasts and Stands, Cobblers' Supplies, Riveting Machines, Corn Shellers, Hog Ringers, Foot Scrapers, Clamps, Tuyere Irons, Hitching Weights, Sod Tampers, &c.

POPE MFG. COMPANY, Hartford, Conn.: Illustrated catalogue of Columbia, Hartford and Vedette Bicycles in both chainless and chain styles, listing from \$100 each down to \$30, with some novel features in the higher priced Wheels; also a new catalogue of the Cleveland and Westfield styles, having the same range of prices.

W. R. OSTRANDER & Co., 22 Dey street, New York: Illustrated catalogue and price-list relating to Speaking Tube Hardware, Electric Bells and Batteries, Electric Light Materials, Telephone and Telegraph Materials and General Electrical Supplies. It contains nearly 600 pages, is profusely illustrated and accompanied by a discount sheet. Although the book is very complete, there are still many lines of goods they carry in stock not found in its pages. They are in a position to furnish at short notice and market prices anything of electrical character.

IRA F. WHITE & SON, 144 Walnut street, Newark, N. J.: Circulars illustrating Household Cutlery, Carvers, Can Openers, Kitchen Outfits, &c.

J. S. WOODHOUSE, 191-195 Water street, New York: Illustrated pamphlet M of specialties in Agricultural Implements for the farm, field, garden, &c. This is supplementary to his catalogue L, which contains over 600 illustrations.

THE BLACK SILK STOVE POLISH WORKS, Sterling, Ill.: Novel calendar in booklet form, in which attention is incidentally called to the advantages of Black Silk Stove Polish.

ALLITH MFG. COMPANY, Chicago: An attractive catalogue of Barn, Parlor and Fire Door Hangers and Fixtures, Store Ladders and Merchandise Carriers. In both text and illustration the aim has evidently been to give both the dealer and the consumer exactly the practical information required. The book describes the Reliable Barn Door Hanger, the Allith Hangers and Fixtures for heavy warehouse and fire doors, the Allith Automatic Self Closing Drop Fire Door Fixtures and Hangers, the Reliable Parallel Track Door Hangers, a new line of Round Track Parlor Door Hangers, Reliable Side, Base Shelf, Overhead Store Ladders, Reliable Merchandise Carriers, single and tandem. Space is also devoted to a new Spring Clevis known as the Smith. In the Door Hangers of all grades the firm uses malleable iron in place of wrought.

A. TREDWAY & SONS HARDWARE COMPANY, Dubuque, Iowa: Spring circular No. 34, dated March, 1905, containing 112 pages of seasonable goods. In it is the announcement of the company's purchase of the stock of Heavy and Shelf Hardware of the Schreiber, Conchar & Westphal Company, Dubuque. While retaining the quarters occupied in the past, the company will remove its office and shelf goods to the buildings formerly occupied by the Schreiber, Conchar & Westphal Company.

PATTERSON, GOTTFRIED & HUNTER, 146-150 Center street, New York, dealers in Machinery, Metals, Hardware, Tools and Supplies: Catalogue No. 39, containing 252 pages, illustrating and describing extensive assortments of Blacksmiths' Tools in large variety.

THE H. D. SMITH & Co. Plantsville, Conn.: Six-page folder of the Perfect Handle Screw Driver for both carpenters, round blade, and machinists (or for heavy service), with square blade, on which to assist with wrench in turning a screw.

CONANT & DONELSON, Greenfield, Mass., manufacturers of Screw Plates, have incorporated in Massachusetts as the Conant & Donelson Company, with an authorized capital stock of \$25,000. Frederick W. Conant is president and treasurer, and Walter E. Donelson, clerk.

Correspondence.

IRON CUT NAILS.

To the Editor: A few months ago I wrote you a letter concerning the manufacture of the so-called "Iron Cut Nails," which you published, and in looking over replies to it which were also published in your pages I was amused at the zeal with which the manufacturers of the alleged Iron Nails sprang to the defense of their goods.

It was interesting to note the ingenuity with which in various ways they attempted to carry the idea that a Nail made out of a scrap pile consisting mostly of steel united with an added judicious percentage of steel turnings and cast iron borings might excusably be branded as an "Iron" Nail, provided a little bit of muck bar were introduced into the pile somewhere under the guise of cover or of filling, or in any other manner that would enable the manufacturer to assert that there was muck bar in it.

In fact, there was but one manufacturer who considered himself authorized to assert unqualifiedly that the Nails made by him and branded as "Iron Nails" were really made directly from puddled iron.

The fact is that one cannot make Iron Nails directly from puddled iron and sell them at the price at which Steel Nails are sold. To illustrate this: Reference to market reports shows that the market price of muck bar (puddled iron) in Pittsburgh is \$28 to \$29 and the price of steel billets \$23 to \$24. The difference is \$5 per ton, and as the waste of muck bars in heating and rolling is much greater than the waste of steel slabs it is evident that Nails made from muck bar would cost at least 30 cents per keg more than Nails made from steel slabs in Pittsburgh; and similar differences of cost in some cases greater and in some less exist in all places where Cut Nails are made.

The fact is, as I have already stated, that the Nails which are sold in the market as "Iron Nails" at or near the price of Steel Nails are not puddled Iron Nails, but are made from plates welded up from scrap heaps consisting largely of steel and from collections of steel turnings and wrought iron turnings and cast iron borings. They are brittle and imperfectly welded, containing many splits, and they are far inferior in strength to the genuine solid Steel Nail. While, since they are made chiefly of steel, there is certainly no conceivable reason for attributing to them any probability of longer life than pertains to the strong and handsome homogeneous solid Steel Nails, rolled down from a solid ingot, without flaws or splits.

It is rather amusing to note that west of the Alleghany Mountains there are still some dealers, and hence probably consumers, who are paying 10 cents per keg extra for these composite, heterogeneous Nails, which have been converted into "Iron Nails" by the simple process of buying a stencil plate bearing the letters "Iron Nails."

Without further comment concerning the honesty of branding as "Iron Nails" Nails which are really made chiefly of steel scrap, it may not be out of place to call attention to the fact that steel scrap, carrying as it does uncertain percentages of carbon, is pretty sure to be overheated and burned in the process of welding, and that it is therefore not strange that the composite Nails are fully as brittle as the old Iron Nails, and are, in use, recalling the old days when a carpenter was known by the black and blue spots on his thumb nail.

SUBSCRIBER.

THE STOVE DEALERS' SUPPLY COMPANY, Milwaukee, Wis., has organized for the purpose of jobbing in Stoves, Furnaces, Stove Repairs, Gas and Gasoline Goods, Stove Dealers' Specialties and similar lines. The company is negotiating for the rental of the three-story brick building at 157 West Water street and expects to be ready for business about April 1. The officers of the company are as follows: Jacob Kornely, president; Wm. H. Busse, vice-president, and Ferdinand Gassman, secretary, treasurer and business manager.

OHIO HARDWARE ASSOCIATION.

CONCLUDING REPORT.

THE morning session on Wednesday, March 1, found the convention in full swing, most of the members having arrived. The Sun Parlor, on the ninth floor of the Algonquin Hotel, which was used as the convention hall, had seating accommodations for only about 250 people; consequently many were obliged to stand, others sat on the stairs at the back of the hall and still others found seats on window sills. The desire of the members to be present, particularly under such conditions, at the various sessions was an evidence of the deep interest taken in the proceedings. After the action taken on the Parcels Post bill, as reported in *The Iron Age* of last week, A. F. Sheldon of Chicago delivered a very interesting and instructive address on "Scientific Salesmanship."

Greeting from National Hardware Association.

At the Wednesday afternoon session President Baker read a telegram which had been sent to Mr. Norvell by T. James Fernley, general secretary of the Wholesale and Retail Hardware Joint Catalogue House Committee, as follows:

Representing the National Hardware Association of the United States, an organization on the membership roll of which are found the names of the up to date Hardware jobbers of the country, will you convey fraternal greetings to the Ohio Retail Hardware Association and assure them that the power, influence and hearty co-operation of this association are at their command.

Secretary Bare was instructed to telegraph Mr. Fernley the hearty thanks of the association.

The Ohio Hardware Insurance Company.

At the opening of the session on Thursday morning a report of the Ohio Hardware Mutual Fire Insurance Company was read by George M. Gray, secretary-treasurer of the company, from which we make the following extracts:

This is a report of a company that is enjoying a healthy growth. It has proven itself a profitable proposition to its policy holders. We are young, but ours is a lusty youth. We are at the point where, if we have the support of the Hardware dealers of Ohio at our backs, we may become one of the best insurance institutions in the State. And there is every reason why we should expect the patronage of the Hardwaremen, for we not only offer a safe insurance, but save you money. And if there is one maxim that rings constantly in your ears from the cradle to the grave it is "a penny saved is a penny earned."

Mr. Gray then submitted a report of the company's business as shown on its books under date of December 31 last. After referring to changes governing the statutes under which the company is incorporated, which it is believed are for the welfare of all who are interested in mutual fire insurance, Mr. Gray continued:

MUTUAL INSURANCE HAS COME TO STAY.

Hardwaremen have found by experience that they have been paying too high rates, and a thorough investigation will convince any fair-minded business man that a mutual company conducted in accordance with the laws of our great State will not only save its policy holders money, but will also build up one of the strongest insurance companies in Ohio. A few years ago the writer was opposed to mutual insurance, but on traveling over our State found that our best business men were taking all the mutual insurance they could get, and on close investigation found that those who were insured in mutual companies were saving anywhere from 20 to 35 per cent. Times change and men change with them, and

we now take mutual insurance in preference to old line companies.

SAVING 33 1-3 TO 60 PER CENT.

In Hon. A. I. Vorys' address to the Ohio Hardwaremen at Columbus, in 1903, he urged that we hold our officers to strict account. The more we have to do with the management of this company we are persuaded that it was good advice. We are daily receiving applications and inquiries for insurance that if accepted and written would probably greatly retard our growth and possibly prove disastrous. Our policy, as stated over and over again, is to have small risks well scattered, and we urge the Hardware dealers of Ohio, first, if you haven't any insurance with us to give us a portion of your risks on your stock and residences, and then, may we ask that you help us to secure good risks on your competitors and friends who are not insured with us? We have 550 risks, and as many of these have more than one policy, the list, when gone over carefully, shows only 480 members. We have 1400 Hardwaremen in the State. It is reasonable to suppose that we should have at least 1000 mem-



bers, who would probably give us 1200 to 1400 policies. These risks, if conservatively placed, taken at the regular rates you are paying, in 10 years will build up a company, judging from past history, that will give us insurance at from 33 1-3 to 60 per cent. cheaper than you can obtain it from any other company.

SOME PRECAUTIONS.

Permit me to suggest that each one of you pay close attention to the surroundings and interior of your stores and buildings. What precaution do you take relative to your waste paper, ashes from your stoves and furnaces, rubbish accumulating from unpacking of goods? What kind of lights have you in your cellars, and are they given proper attention. The writer went into the cellar of a retail Hardware store not long since to find seven jets burning gas, the light from which was but 5 inches from the ceiling, which was unprotected. I found the ceiling or floors above had been saturated with floor oil, and had the floor caught from one of these lights it would have been almost impossible to save the building. The flues in the chimneys of every building require the special attention of the owners at least once a year. Statistics

will show that the cause of the majority of fires has been traced to imperfect flues. Another very dangerous article in a store is open cans of Paint, Japan Dryer, &c.

Last, but not least, we would say, only the watchfulness and care relative to your form that covers your stock will keep you on the safe side in case of disastrous conflagration. The best time to adjust a loss by fire is when the policy is written. Every policy holder should have a printed form and, as it is far better and easier to pay a lawyer to keep you out of trouble, rather than pay one for getting you out after you get in, have your lawyer help you get up your form, and then your policies will all concur, which is very important.

IMPROVED BOOKKEEPING.

I am glad to note that during the past few years there has been quite an improvement in the system of book-keeping among the Hardwaremen. Our worthy friend, Henry F. Rahe, states that our last adjustment was the easiest he ever had. The assured had his loss list all made out. His books were kept systematically, so the adjusters could find what they wanted without any trouble. "I think I have so much," or "About so much," does not go in adjusting a loss. Every business man should systematize his business so he may see his weak points as well as his strong ones—what comes in as well



G. M. GRAY.

as what goes out. Policies written for jobbers and large dealers must be in accordance with their splendid system or be rejected. Why should this not apply to the small dealer as well?

In conclusion, I have endeavored to show you in my report our company in its true light. We are building on a solid foundation that will weather the storms that are sure to come. There is little use in ringing the bell, be it ever so loud, to call men to an empty table. I want the Hardwaremen of the State to look upon this as their company—as a part of their business investment. It is trite, but true, that "United we stand and divided we fall." In these days of keen competition expenses must be shaved down where they can be, and one way to save money is to place your insurance in the Ohio Hardware Dealers' Mutual Fire Insurance Company. It is cheap and it is "safe and sane" as well. You will always find us willing and ready to stand forth in the limelight at all times and take you into our confidence on all points. We want your insurance and we shall ever try to merit your friendship.

W. P. Lewis, New Albany, Ind., of the National Hardware Mutual Fire Insurance Company, spoke briefly on the advantages to the members of the Ohio Hardware Association insuring in the various Hardware mutual insurance companies. He referred to the desirability of a

combination of all the State companies, or a merger of them, at some future time, into the National company.

Grievance Committee.

In the report of the Grievance Committee it was stated that only two complaints had been received during the year and that both had been satisfactorily adjusted.

Address of W. R. Belknap.

W. R. Belknap of the Belknap Hardware & Mfg. Company of Louisville, Ky., made an interesting and felicitous address. Touching on the subject of the education of the Hardware clerk, Mr. Belknap spoke as follows:

It may be said that the Hardware clerk doesn't differ essentially from clerks in any other calling, but in this day of specialization we cannot afford to look after the bank clerk and dry goods clerk if we are to win our way in Hardware—the definition of that is wide enough in all conscience. If we succeed in beating a good path in that worthy calling we have done well. We have a revival down our way and everybody is quoting Scripture. In fact, it is helpful at all times and I don't believe it would be wasted on this audience here. St. Paul stated that he was indebted to the Greek and the barbarians—people of all kinds. We know how nobly he went about discharging that indebtedness in the coin of his own stirring words, by his own sufferings and privations; not consulting bodily ease, but rather laboring for the benefit of all those with whom he came in contact. We cannot get along without help. We know how expensive a proposition the negligent, indolent and inattentive clerk is. He can lose us money faster than we can make it if we let him have his own way.

Therefore we should have enough interest in him to train him up in the right way, persuade him of the necessity of such preliminary attainments as writing a good, clear hand, of making definite statements and reports, of setting down a column of figures so that the figures are all legible and the column doesn't look like the leaning tower of Pisa.

A POSITIVE ASSET.

When we have educated him we have then placed in his hands a positive asset for his own future use—one that he can draw against at all times and have his drafts honored. All of us have applications from young men from country or small towns, and we know what a difference it makes in the impression upon us if these letters come neat and clean, indicative of mental alertness and interest in every word.

We are indebted to this young man just as St. Paul was to the rest of mankind. We have freely received and freely we ought to give. We have to take these young people in hand, not harshly and not in a fault finding spirit, but to train them up. They may have graduated at the high school or college, or they may, on account of adverse circumstances, go to work early and come to us out of the ward or district schools or off the farm. In any event, we are giving them the final touches on their early education and it is our duty to do it patiently. We ought to give it ungrudgingly—even if it is apparently for somebody else's benefit.

We are told that the greatest of all sculptors used to look with rapture on each rough block of marble, because he saw within its rude surface the angelic form only waiting to be chiseled out. So in the unpromising shape that humanity often comes to us in, if we would look beyond the exterior we could see the possibility of the liberated mind and spirit only waiting to find their expansion under some older, guiding hand.

I suggested once before that we try to

BUILD UP THE HARDWARE TRADE

so that there shall not be room for a mean man in it. If we are to achieve this we must begin with the younger generation. Those of us who have reached the meridian of life will soon be relegated to the easy chair. The young man who is sweeping up and arranging stock for us to-day will be the one on whom the responsibility lies. Let us be patient with him, but not willing to deceive him by failure to set him an example or point out to him by precept, too, the only true way to success and

happiness as we understand it, for there is no true success without the latter.

WE MUST BE SYMPATHETIC TO HIS DISAPPOINTMENTS, and if his grandmother insists with singular fatality upon falling sick the very afternoon of the baseball game we must remember that age has its weakness as well as youth. Let us train them up and get the young men to look back upon the days of their youth in the Hardware store as the best of their schooldays, while their education went forward *con amore*, by reason of the interest which their business schoolmaster took in them. The details of business are recognized to be more complex. We have to be careful about our stocks—their arrangement; the disposition of dead material; covering more scientifically with insurance lest the fire comes just at the time when the policies have lapsed. We want our books kept so that our stock shall be easily taken at any time; in short, we want a great deal more done than we can do ourselves. For all this we must rely on our good clerk help, and unless we have been willing to give of our own experience, our own labor and our own selves we can hardly expect to have these poured out on us in full measure.



A. L. SHEARER.

Referring to the fact that the care of clerks was an important factor in running a store, President Baker spoke of teaching them order and cleanliness and politeness, which could be done in a pleasant way each day in such infinitesimal doses as not to be distasteful.

Mr. Lloyd's Address.

Mr. Lloyd of the Bindley Hardware Company, Pittsburgh, Pa., invited to address the meeting, said he was much impressed with the attendance and with the earnestness of not only the speakers but auditors. Having had experience in association work in connection with the Merchants' and Manufacturers' Association of Pittsburgh, he said the strength of an association and its growth and development depended on the interest and earnestness of the members.

Election of Officers.

The following officers and committees were chosen for the ensuing year:

PRESIDENT, John F. Baker, Dayton.
VICE-PRESIDENT, C. S. Johnson, Barberton.
FINANCIAL SECRETARY, A. L. Shearer, Dayton.
TREASURER, L. F. Stahler, Waverly.
SECRETARY, Frank A. Bare, Mansfield.
EXECUTIVE COMMITTEE: John Kramer, Dayton; C. W. Jewell, Utica; W. S. Perry, Zanesville; Frank W. Ingalls, Bryan; Will M. Crumrine, Salem; A. Boebinger, Cincinnati; John S. Spoerl, Hamilton; W. L. Jacobs, Youngstown.
GRIEVANCE COMMITTEE: J. K. Mulligan, Bellefontaine; J. J. Ewing, Lima.

C. S. Johnson of Barberton and Frank A. Bare of Mansfield were chosen delegates to national convention.

Treasurer's and Financial Secretary's Reports.

L. F. Stahler, treasurer, made his annual report, showing a balance on hand February 28 of \$455.

The financial secretary, A. L. Shearer, said the present year was the most prosperous in the history of the association. Up to the time of making the report there were about 400 paid up members, with many yet to hear from.

Resolutions.

The Committee on Resolutions presented the following, which were adopted:

Resolved, That the convention reaffirm the resolutions adopted at the fourth annual convention, in 1898, and reaffirmed at Cleveland in 1900, at Columbus in 1903, and again at Cleveland in 1904.

Resolved, That on account of the confusion caused by the use of the different wire gauges by the many manufacturers, we recommend and ask of the manufacturers that they adopt one standard gauge for all metal sheets and wire.

Resolved, That the association recognize and approve of the laudable work being done and accomplished by the Wholesale and Retail Hardware Joint Committee.

Resolved, That we recognize the untiring work and loyal support accorded our association by the commercial travelers, and thank them for their loyalty and endeavors to make our visit here pleasant and memorable.

Resolutions of thanks were also adopted to the Dayton Hardware merchants, the local and trade press and others who had contributed to make the convention a success. A special resolution of thanks was tendered to the National Cash Register Company for the splendid entertainment and banquet, the artistic programme gotten up for the meeting and the general solicitation shown in the work of the association.

Memorial Committee.

The Memorial Committee made the following report, which was adopted:

In accordance with the just and unchangeable plan and purpose of the Giver of life and light and hope, and by His inscrutable decrees, our friend and brother worker in our chosen walk of life, J. H. Kauke, late of Wooster, has been chosen to pay the debt of living, has been called to that bourne beyond the dark river whence no traveler returns. For threescore years, nearly the allotted measure of life, has our worthy and aged friend, through those long years of trade and trial, carried the banner of honor and business integrity steadily and undimly—*a fitting guide for future followers*. He was a pleasing pattern of the old school of honesty, business methods and social amenities, retaining and enjoying the confidence and respect of the community where he lived to the unusual but ripe old age of 90 years. His day book and ledger of life are closed. Therefore, be it

Resolved, That the sympathy and condolence of our association be extended to his friends and family; that a record of this be made on the minutes of the association and a copy thereof be sent to the family of the deceased.

Laws Relative to the Hardware Trade.

The Committee on Laws Relative to the Hardware Trade made a report, in which the matters of parcels post, trading stamps and revision of several State statutes were touched on. The suggestions of the committee were adopted.

Next Meeting at Canton.

The association decided to hold the next annual meeting at Canton.

Question Box.

Much more prominence was given to the Question Box than at former conventions, the questions being read during the various sessions. Among the questions considered were the following:

Would it be advisable to request the manufacturers of Fence Wire to use the same gauge as is used for Copper and Brass Wire, and is it desirable to use the Brown & Sharpe gauge for all Wire?

The sentiment of the convention seemed to be that there should be a universal gauge for all classes of Wire. A resolution to this effect was adopted, as noted elsewhere.

What is the best way of keeping record of past due notes—notes that have become due and unpaid?

It was suggested that a bills receivable book be kept; also that notes be put in bank for collection.

Is the Ohio Hardware Mutual Fire Insurance Company accepting insurance outside of the regular lines of Hardware, and if so is it safe to do so?

One of the directors stated that some absolutely safe insurance had been taken in small policies outside of the Hardware people in the State, and that more policies were turned down in the association and outside than were accepted.

Is the Seed business profitable and a desirable line to add to Hardware?

Delegates expressed themselves favorably, stating it was a profitable line to handle.

Does any member operate a cash department along with the credit business, and how does it work?

One delegate said that he did an exclusive cash business and had made it a success during the past six years.

I want to increase the interest of my clerks in my business by giving them a percentage of the profits in addition to the regular salary. What should be a rea-



L. F. STAHLER.

sonable rate, and on what should it be based—cost of goods or gross amount of sales?

A delegate stated that two years ago he changed his business from a copartnership to a stock company; that he invited his employees to take stock in the corporation and that many of them did so. The plan proved a great success. He thought the co-operative plan was the best thing in the retail Hardware business.

Would it not be a good thing to have a standard gauge for Threaded Bolts and Nuts?

Upon motion a resolution was passed asking the association delegates to the national convention to bring up this question, and address a circular to Bolt manufacturers asking if they could not make a standard gauge.

What would you do regarding supply houses who quote factory buyers discounts lower than can be obtained by dealers from manufacturers and jobbers on standard goods?

The general sentiment was that such supply houses should not be given orders by retail Hardware merchants.

What action do you suggest in case of retailing jobbers? What should we do to meet this competition?

A delegate remarked that there were very few large jobbers in Ohio that did not have retail stores. The matter had been taken up before and nothing done about it. It was, however, thought to be fair competition.

Can a firm or individual be held liable for damages for failure in filling orders taken by a traveling man?

The experience given was to the effect that shipments were generally insisted upon.

How can we improve clerks?

An instance was related where a concern paid their clerks 1 per cent. commission upon the gross amount of their sales each month. A suggestion was to the effect that clerks should be politely treated, and that the proprietor should let them see that he appreciated their efforts in his behalf.

What is the best principle in collecting accounts?

A delegate recommended the plan of local organizations in towns and cities, where the various merchants could compare credits of their customers, thus soon weeding out deadbeats.

Do special sales of from one to ten days for advertising purposes pay?

A difference of opinion existed on the advisability of special sales. The experience of one delegate was that it was not desirable to make special sales on standard goods.

Banquet and Entertainment.

At the close of the afternoon session on Thursday the members of the association accepted the invitation of the National Cash Register Company to go through its plant. Trolley cars were provided, and about 500 availed themselves of the privilege. As the result of the tour of the various buildings the most lasting impressions made upon the minds of the visitors probably were the intelligent and healthful appearance of the employees, the cleanliness of the 24 acres of floor space and the arrangements everywhere apparent for the comfort of the employees. After completing the inspection of the plant, the members were invited to the woman's dining room, where a banquet was served by the company. At the conclusion of the dinner the members were invited to the assembly hall, where an excellent programme was carried out to the enjoyment of the members. This consisted of addresses, a stereopticon lecture, showing the growth of the company and its system of management, and music by the members of the company's orchestra.

A. A. Thomas, secretary of the National Cash Register Company, welcomed the visitors in a felicitous address, to which John F. Baker, president of the association, appropriately responded.

H. C. Wiseman then proposed a resolution of thanks to the company for its splendid hospitality to the association, which was adopted by a rising vote. Addresses followed by S. Norvell, W. R. Belknap, M. L. Corey, W. P. Bogardus and A. F. Sheldon.

At the close of the evening's proceedings a souvenir in the way of a pamphlet describing the great plant of the National Company was distributed.

CATALOGUE HOUSE COMPETITION.

S. Norvell of the Norvell-Shapleigh Hardware Company, St. Louis, chairman of the Joint Catalogue House Committee, was present at the convention and made an address in which he touched at length upon the work already done by the committee and what remains to be accomplished in the future especially through jobbers and their salesmen and the retail merchants. As an official expression of the committee we take pleasure in presenting this interesting address almost entire:

In the past 30 days it has been my privilege to address meetings of retail Hardware dealers in Milwaukee, Des Moines, Louisville and Indianapolis. This is my fifth and last address. I estimate I have talked to 2000 associated retail Hardware dealers in this time. All of the meetings have been characterized by earnestness and enthusiasm. It is evident to me that the association idea is not one of the hour, but has come to stay.

While I have indulged in some variations, my addresses have all covered the same general subject of the catalogue house question. This will be the first address that will be given to the trade papers. There are several reasons for having it published now. First, because if it had been published before it would have been very much hackneyed by this time. Another reason is that, notwithstanding my request, extracts have been published from the previous addresses, which, taken by themselves, are liable to give wrong impressions. Some of my associates have also requested that my remarks be published for the benefit of those dealers who have not had an opportunity to attend these meetings and who are very much interested in the catalogue house subject.

Allow me to say in the beginning that the points raised in this address and the suggestions offered are not all original. In the past year many suggestions and ideas have come to me from manufacturers, jobbers and retailers. The best of these I have tried to assimilate and now give them to you in a brief and suggestive form. This paper is simply an outline of facts with some suggestions. In other words, it is a plain, straightforward business document.

STARTING THE BALL ROLLING.

Just 11 months ago the general Hardware trade was divided into a number of State retail associations, the National Hardware Association, the Southern Hardware Jobbers' Association and what are known as the independent jobbers. There had been a good deal of muttering, especially in the retail trade, on the subject of catalogue house competition. At that time no plan had been devised to meet the competition of this comparatively new system of distributing goods. On April 7, 1904, a letter appeared in *The Iron Age* from a certain Western jobber. This letter outlined the situation and emphasized four points:

1. That the systems of selling goods by jobbers and retailers on the one hand, and through catalogue houses direct to consumers on the other, were antagonistic and could not continue to exist side by side. That if the system of the catalogue house



W. S. PERRY.

was to increase and flourish the other system must necessarily decline and pass away.

2. That this question of the catalogue house was the paramount issue of the hour.

3. That neither the jobbers nor the retailers in their associations had forcefully grappled with this question.

4. That on this one issue, which was so vital to the interests of both, there was no reason why jobbers and retailers should not unite for the common defense.

A strong editorial commented upon this letter when it was published. The effect of the letter was instantaneous. The question was immediately taken up by the various trade papers and its pros and cons were widely discussed from the viewpoints of the manufacturer, the jobber and the retailer.

Mr. Norvell then referred to the events which led up to the formation of the Joint Catalogue House Committee, its personnel, &c. Continuing, he said:

LINING UP IN DEFENSE.

Eleven months ago almost every manufacturer in this country in the Hardware line was doing his level best to sell catalogue houses. To sell them was considered just as legitimate as to sell the best Hardware jobber in the land. All the jobbers, with very few exceptions, who were so situated that they could sell catalogue houses or who had the price to sell them were making great efforts to get their orders.

What is the situation to-day? Over 600 of the most prominent Hardware manufacturers in the United States have gone on record that they will not sell catalogue houses, and not a Hardware jobber of any standing, either an association member or an independent, will fill an order from them at any price. In the present temper of the trade, which has been brought about, we claim, by the agitation of this subject under the influence of the Catalogue House Committee, it would be almost business suicide for a Hardware jobber to be caught supplying catalogue houses with goods.

CRIPPLING THE ENEMY.

In St. Louis two catalogue houses have gone out of business, and those that remain are crippled because they cannot obtain supplies through the jobbers doing business in that city.

In Kansas City a catalogue house of considerable importance desired to go into bankruptcy, but the creditors of that house were so fearful of their names being given to the public that they got together and made a settlement out of court very favorable to the proprietor of the catalogue house.

In Chicago the catalogue houses are so hard pressed to obtain certain lines of goods that have been denied them by the manufacturers that they are doing their best to buy them from outside sources, even from retail dealers, and have sent circulars widespread to the retail trade offering them a commission to purchase goods for them.

On the letterheads of all the principal Hardware jobbers, both association members and independents, you will find printed, "We do not sell catalogue houses."

RESULT OF HIGHER EDUCATION.

These changes which have been brought about in the sentiment of the trade, on the part of both manufacturers and jobbers, have been caused almost entirely by higher education on this subject. It is absolutely true that one year ago neither manufacturers nor jobbers had given this question very much thought. When the exact conditions were brought to their attention hundreds of manufacturers and dozens of jobbers, without the slightest hesitation, stated they would decline to sell this class of trade in future.

The trade papers deserve a large measure of credit for assisting in this campaign of education. While the Catalogue House Committee has borne the brunt of some criticism, in the main it has received loyal support from the trade press of the country.

At first many manufacturers did not take this movement seriously, and thought it would soon pass away, but by this time few, if any, doubt that both jobbers and retailers are deeply stirred on this subject, and that this agitation is here to stay until the abuses of the catalogue houses in the Hardware line are checked.

THE PLATFORM.

As chairman of the Catalogue House Committee I wish to emphasize the platform for this committee which was adopted at the St. Louis meeting:

We prefer that manufacturers should not sell to catalogue houses. If they do sell them we believe their prices should be so regulated that they will not cut prices on well-known manufacturers' brands to take advantage of the consumers of the country by giving them the impression that they sell all their goods in the Hardware line on the same low basis.

CONTROLLING PRICES A FAILURE.

It has developed in the experience of more than one manufacturer that the idea of controlling the prices of catalogue houses on well-known brands is a failure. The constant struggles and misunderstandings which have existed between prominent manufacturers and the catalogue houses on this question are evidence of this fact.

When they do not directly cut prices they have a system of offering gifts or prizes which actually cuts the price on all these lines of goods.

Such prominent manufacturers as the Stanley Rule & Level Company of New Britain, Conn., and North Bros. Mfg. Company of Philadelphia, Pa., have hopelessly given up the task of attempting to regulate catalogue houses, and have therefore decided not to sell them under any conditions. Many other well-known manufacturers might be named who have had the same experience.

When such powerful and well managed concerns admit their impotence in regulating the prices of catalogue houses does it not seem vain for other manufacturers to claim they can sell them with the assurance that their prices will never be cut? What guarantee have they that at the first difference arising between themselves and the catalogue houses the trade of the country will not be treated to a recurrence of their cut price methods on the entire line of goods of such manufacturers?

DEFENSIVE, NOT OFFENSIVE.

It has been claimed by some that this campaign by the united jobbers and retailers against catalogue houses was initiated by this recent movement. It should be distinctly understood by all that the jobbers and retailers are simply acting upon the defensive. For years past the catalogue houses have been educating the consumer of the country to believe the retail Hardware dealer is a robber and that there is no reasonable excuse for the jobber to be on earth. The time has simply come when they are beginning to reap what they have sowed.

I also wish to emphasize the fact that our Catalogue House Committee feels it has been engaged largely in a campaign of education. It has used no threats. The word boycott is not in its vocabulary. But it would be

folly to say that both jobbers and retailers do not feel in this fight they should stand by those manufacturers who are willing to help them perpetuate the system of doing business which means their livelihood.

PRICE CUTTING.

It has been claimed by manufacturers that retailers themselves cut prices. This, of course, is admitted. But when a retailer cuts a price it affects only one sale or at most the sale of a line of goods in his immediate and limited vicinity. On the other hand, when a catalogue house, for purposes of advertising or in a spirit of revenge, cuts prices on an entire line of standard goods it means the demoralization of this line in every part of the United States. It seems hardly reasonable that any manufacturer who realizes that the profit which can be made on his goods is one of his best assets would take the chance of putting his goods into the hands of catalogue houses.

The manufacturers, on the other hand, have claimed if they decline to sell the catalogue houses then they themselves will bring about this cutting of prices. It may be true that temporarily they may suffer in this way, but evils of all kinds have seldom been cured without temporary suffering, and I am sure I speak for the jobbing and retail trade of the country when I say they are willing to put up with loss of profits for the time being on certain lines of goods if they are convinced that in the end it will bring about a better state of affairs. Things must often be made worse before they become better.

We all must realize that if manufacturers, jobbers and retailers are sincere in this movement and will stick together shoulder to shoulder, the catalogue houses will soon become weary of the unprofitable pastime of obtaining goods indirectly and sacrificing their profits on them.

ALL THAT GLITTERS IS NOT GOLD.

Again, you must not forget that the cost of doing a catalogue house business is something enormous. Every catalogue house is afflicted with a tremendous claim department. Goods are returned to them in exceedingly large quantities. There is great waste in the distribution of their catalogues. I am even told in some sections retail dealers have had a large number of people in their vicinity send for their catalogues, and that they have been destroyed as soon as received. This practice has so much injured the catalogue houses they have now adopted a new system of distributing their catalogues through certain individuals in each community.

SHALL THE TAIL WAG THE DOG?

Let me bring to your attention the fact that it is admitted all the catalogue houses in the country combined do not sell over 5 per cent. of the Hardware consumed in the United States. Ninety-five per cent. of the goods in which we deal is distributed through the retail trade. The great harm of the catalogue houses is not so much in what they sell as in the demoralization of prices. Is it not hard to understand why a manufacturer who sells 95 per cent. of his product through jobbers and retailers should stand out for the trade of a certain class of customers who take only 5 per cent. of his output when it is made clear to him that this class of customers is demoralizing all others who sell 95 per cent. of his goods?

NO SUPPLIES FROM MANUFACTURERS.

There is no doubt that the manufacturers can best help us by turning down the business of the catalogue house. This country has done a great deal for its manufacturers. We have protected them with tariffs and with patents. Some of them have then protected themselves with trusts, pools, associations and other combinations. Now when the jobbers and retail dealers ask them for a little protection we do not think they are justified in giving us a stone when we ask for bread.

A QUESTION OF SELLING.

Now I wish to take up the future of our work through jobbers, their salesmen and retail dealers. As I said before, the manufacturers can best help us by not supplying catalogue houses with ammunition in the form of goods. Then they should let the jobber and retailer fight this battle. After all, it boils down to a question of selling. The manufacturers want business to run their mills. They must have this business. The jobbers want business to keep their plants busy. They must have this business. The retail dealers must have business or they will be eliminated. Therefore the manufacturer looks to the jobber for business, the jobber looks to the retailer and the retailer must get this business from the consumers in his immediate territory.

THE JOBBERS MUST HELP THEIR CUSTOMERS

In every way to sell goods. They must not only regulate their prices to put the retail dealer in position to meet catalogue house competition, but they must assist their customers in other ways, such as helping them in advertising, supplying electrotypes and giving them selling ideas.

Many retail dealers in the past year have asked me why jobbers do not issue a priced catalogue so retail dealers can intelligently take orders for goods they do not carry in stock. Don't think that the jobbers of the country have not considered this question. They have thought of it very seriously. They have approached the subject with approximate price-lists and with loose leaf catalogues. The approximate price-list, while a good thing in some respects, does not altogether fill the bill. I am informed the loose leaf catalogue has not been a great success because retail dealers will not take the time and trouble to insert the pages.

PRICED CATALOGUE DANGEROUS.

Now let me tell you that the issuing of a priced catalogue by one of the large jobbers in the country is a very dangerous thing. Such a catalogue would put the key to the wholesale Hardware business practically in the hands of the possessor of the catalogue. It would no doubt be a great convenience to the possessor of this catalogue, but here is the danger: The first house that issued such a catalogue might be exceedingly careful in whose hands it was placed; they might send it to Hardware dealers only. Another house, following their lead, might do the same thing. But when the break is once made by any house all the larger jobbers will be compelled to issue priced catalogues.

The result will be inevitable that some house will not be very careful whom they sell, and therefore you will find a priced catalogue covering the entire line of Hardware, Cutlery, Sporting Goods and House Furnishing Goods probably in the hands of every dry goods store, drug store and grocery store in the country. Then all classes of dealers will be in position to take orders for Hardware. It is a serious question whether the issuing of catalogues with price-lists by jobbers will not injure the retail Hardware dealer more than it will benefit him.

As the case now stands, the intelligent, well posted retail Hardware dealer, if he is alive, is in position to become posted on a great many lines of goods he does not carry. From time to time he can write for quotations and obtain prices from visiting salesmen and gradually mark up his entire catalogue. To-day the knowledge of the business of the Hardware dealer is still worth something to him. On account of catalogues it is not of as much value as it was 15 years ago, but nevertheless his advice is sought on Hardware subjects in his town. But if all Hardware knowledge is placed in catalogues, with prices attached, will not the grocery dealer be just as well posted as the Hardwareman?

WHOLESALE CATALOGUE HOUSES.

To give you a clearer view of the situation I refer you to catalogue houses that do not sell consumers, but sell direct to retail dealers. They use priced catalogues. They do not discriminate in the slightest as to the class of their customers. They sell all kinds and conditions of dealers. There is no doubt this class of catalogue houses has done more to scatter Hardware, in the shape of 5 and 10 cent counters and also in the way of regular stocks in the hands of grocery dealers, department stores, general stores, &c., than any other class of jobbers. Nevertheless I am advised the exclusive retail Hardware dealer patronizes them to some extent, and I see in the trade papers recently that by their advertisements they are especially seeking the business of retail Hardware dealers.

ONE OF THE JOBBERS' PROBLEMS.

Jobbers have many problems to be solved. One of the great problems before every jobber is just how far he should go in the way of discrimination between the classes of his customers. The disposition of manufacturers to seek the retail trade on one hand and the retail dealer to buy direct from manufacturers on the other, the catalogue house selling to dealers distributing Hardware to all classes of trade and thus cutting off a part of the business of the exclusive retail dealer, make him hesitate before committing himself to a policy of selling retail Hardware dealers only.

I do not believe it is fully appreciated by the trade what a large quantity of Sporting Goods is sold by pawnbrokers. I am told certain exclusive Sporting Goods jobbers derive a large part of their support from this class of trade.

This subject might be continued indefinitely, but it must be apparent to all that the main question to-day in the Hardware business for the manufacturer, the jobber and the retailer is one of sales. It is a plain fact and one the retail dealer must never forget, that he can resolute and re-resolute, but if his resolutions are not backed up by orders he will soon be out of the game.

BUYING VS. SELLING.

I have been in the closest possible contact with the retail Hardware trade for over 20 years. For ten years I was a traveling salesman on the road. I beg to repeat here what I have said hundreds of times before—I have never known a retail Hardware dealer to make a success simply buying goods. I have seen hundreds of retail dealers make a success because they were good salesmen. Of course a reasonable amount of attention must be devoted to buying, and when I refer to buying I do not mean in a sense selecting the right kind of goods or the right assortment; I mean as pertaining to the question of price.

I find most proprietors of retail stores who have several clerks do all the buying themselves—they seem to consider the buying of the greatest possible importance. They entertain every salesman who calls. They allow this salesman to consume just as much time as he wants. Probably three-fourths of their time is devoted to entertaining salesmen and to buying and one-fourth of their time to everything else. The salesman gives his talking points to the buyer, the buyer seldom sells any goods and seldom gives the talking points to the retail salesman who sells the goods. Therefore the talking points never reach the clerk.

I recommend that proprietors in retail stores devote three-fourths of their time to selling and to meeting their customers and one-fourth of their time to everything else. I recommend you have the salesmen who visit you give the talking points to the men who sell the goods. I recommend higher education for Hardware clerks, especially along the lines of selling.

RETAILER'S RECORD OF CUSTOMERS.

Every Hardware jobber and every catalogue house has a carefully prepared and kept card system giving the names of all desirable customers in their territory. It is expensive to keep up these cards, but they must pay or the expense would not be continued.

In every first-class Hardware jobbing house in this country at a minute's notice not only the rating, lines of goods carried, but even the personal peculiarities of almost every dealer in their territory can be looked up by the card system. These cards are arranged by States, by towns and by dealers.

These jobbing houses are constantly going over these cards with their salesmen and direct with the trade, seeking to get the business of good dealers who are not buying of them. Little is left to memory. Little is left to chance. It is an exact fixed selling system.

Catalogue houses have the same system. If you will go into the sales department of a catalogue house they can refer to a certain town, and tell you just how many goods they sell to this doctor, or to that lawyer, and also the class of goods he buys.

Now, let me ask, what is the retail dealer doing along these lines? How many retail dealers keep any such record of their customers? How easy it would be to divide up your town customers and your country customers and keep a record of their purchases, and also a record of good people who are not buying from you. How easy it would be to educate some boy or girl to keep up this system in your office, and send out circular letters inviting these buyers to your store, calling their attention to desirable goods or quoting them prices.

Do you know, for instance, that some of the best sporting goods customers in the country are professional men—doctors, lawyers and even ministers. Where do these men buy their fine Guns? Where do they buy their Hunting Clothing? Where do they get their Ammunition? How many retail dealers have all this class of consumers tabulated?

FIVE PER CENT. VARIATION IN COST.

I have before stated I believe if ten towns of 1000 inhabitants each were selected in any State and if one exclusive Hardware stock in each of these ten towns was invoiced there would not be found a variation of 5 per cent. in the average cost of the goods. I have further stated, and I believe it to be a fact, that there would be a variation in the valuation of the goods, on account of the assortment, quality and condition of the goods, of from 25 to 50 per cent.

If this is true—and I believe every salesman who travels over any State will agree with me that it is true—is not a dealer who devotes three-fourths of his time to the price of his goods making a mistake? Will it not be better for him if he devotes more of his time to obtaining the control of satisfactory lines and then training himself and his salesmen in the ability to sell these goods?

A great advantage enjoyed by the catalogue houses is in the fact that they do business for cash. They get the cash before they ship the goods. They practically do their business upon capital supplied by their customers, while the farmer, on the other hand, frequently conducts

a large part of his business upon the capital of the retail dealer.

I wish also to say here that in my opinion a retail dealer makes a mistake in buying his goods from too many sources. This complicates his work, mixes up his lines, takes more of his time listening to salesmen, and gives him less time to devote to developing his selling ability.

THE WASTE OF TIME

in this country on the part of proprietors of retail stores and their clerks is something prodigious. They think they are busy simply because they put in long hours at the store. But there is a vast difference between being simply at the store and using their time to the best possible advantage. I have known what traveling men call "mean merchants." They sometimes cut the traveling man rather short. But I have seen these merchants succeed because they saved their time and used it where it would count the most. I of course believe salesmen should be treated with courtesy, but a wise salesman should know when it is time to quit.

SHOWCASES, WINDOWS, TELEPHONE, &C.

I count your showcases and your show windows as salesmen. I count the appearance of your store as being in the selling department. I count the proper keeping of your catalogues, circulars and price-lists as being part of the selling system, because you use them in taking orders from your trade and you miss orders when you cannot find the proper catalogue. I count the proper answering of the telephone as selling. To this I also add the proper use of the rural free delivery system.

A WORD TO SALESMEN.

Now let me say just a word to the salesman. The salesman is more interested in this catalogue house question than anybody else; it is of more vital importance to him. If the catalogue houses predominate, then it is a comparatively simple thing for large jobbing Hardware houses to add to their lines and turn into catalogue houses. It probably would mean simply the loss of profit for a year or two while the change was taking place. This would eliminate all salesmen.

Even if catalogue houses were in all the large cities in the land there would still be some retailers left. The number of retailers existing to-day might be reduced from 50 to 75 per cent. and these dealers would have to seek their livelihood in other vocations. But as long as there is an immediate demand for goods and as long as some people are compelled to buy on time there will be retail dealers left.

But the general prevalence of the catalogue house means the absolute death knell of the system of selling goods through salesmen. Therefore it behooves the salesmen of to-day to use their very best efforts not only to sell goods and to be profitable themselves, but also to do everything in their power to help their retail customers to be better salesmen and to keep better stores and thereby command a larger share of the business.

CREATING BUSINESS.

In this connection let me say I have asked many retail dealers if they realized how much business was created every year. They did not understand my meaning. Most retail dealers, it has seemed to me, have thought that business came simply from the necessity for the goods. This is a great mistake. A large part of the business every year is created, not by necessity, but by caprice or whim, or by a temporary desire aroused by advertising or by seeing an article. If the article is not seen it is not desired. If it is not desired it is not bought.

How many of us have lived happy for years without a Camera, but how often our spare money has gone for a Camera or some other article on account of a temporary desire, and after a while the Camera and the photographs were all laid away. What caused the great boom in Bicycles? A temporary fad, temporary desires. Still many people got rich in the business while the fad lasted.

ARTIFICIAL OR STIMULATED DESIRES.

Every man spends every year a certain percentage of his income on what you might call artificial or stimulated desires. If the book store, the clothing store, the dry goods store find it possible to stimulate a sufficient amount of desire for certain things in their line then the surplus money is spent in these stores.

It is my belief that the retail Hardware trade to-day do as little as any line of business in the country to stimulate a desire for the fancy goods in their line. The Hardwareman rather prides himself that his business is one of the necessities of life. Therefore when he opens his store he stands around and expects the trade to come to him. I believe one of the greatest fields for development of the Hardware trade to-day is the stimulation of the desires of the people for a greater variety of goods in

the Hardware line. This idea has been more largely developed in the Builders' Hardware line than in any other. A common cheap Rim Lock will probably hold a door just as fast as any of the finest real bronze designs, but with the development of elegance, refinement and taste in this country the Builders' Hardware dealers have developed a taste for fine Hardware. This Hardware is not necessary, it is simply a developed want.

ASSOCIATION WORK.

Now in conclusion of this very long article, let me say that I have become a member of a Hardware association. I have never had any cause to regret this move. I believe it is only through associations of jobbers and retailers that we can improve the conditions surrounding our business. I hope to see more life, power and enthusiasm in these organizations. I hope to see the best men take hold of their affairs and rise to the top. I hope to see less criticism of the aggressive man on the part of the do-nothing, so-called conservatives.

I trust in the larger cities the Hardware jobbers will get together and lead a movement among dry goods dealers, boot and shoe merchants, grocery merchants and others to check the catalogue house system.

LOCAL EDUCATION CAMPAIGN.

I hope in the smaller towns to see retail dealers form town organizations. Systematically find out every man in town and out of town who sends away to catalogue houses for his supplies. The influential men of your town should be led into this movement. The banker and editor can both help you. The doctor and the lawyer can also do their part. Many a doctor who derives his entire support from his townsmen has never thought that he was injuring his own town by sending away for goods. He needs a little education. So does the lawyer. So does the banker. So does the farmer. This educational campaign can be carried on in many ways, and I believe when all the facts in regard to this catalogue house competition are known all of us will agree with President Roosevelt when he expressed himself in his recent message to Congress as follows:

The farmers, the mechanics, the skilled and unskilled laborers, the small shopkeepers, make up the bulk of the population of any country, and upon their wellbeing, generation after generation, the wellbeing of the country and the race depends. Rapid development in wealth and industrial leadership is a good thing, but only if it goes hand in hand with improvement, and not deterioration, physical and moral. The overcrowding of cities and the draining of country districts are unhealthy and even dangerous symptoms of our modern life.

CONVENTION NOTES.

The National Cash Register Company designed, printed and donated the programme of the association convention and the programme of the banquet.

A handsome souvenir portfolio, containing views of public buildings and points of interest in and about Dayton, was presented each member of the association by the local merchants.

The American Telephone & Telegraph Company and the United States Telephone Company permitted the free use by the members of the association of their toll lines as well as the local lines from 5 o'clock in the afternoon until 9 o'clock in the morning during the convention. This enabled the members of the association to keep in close touch with their families and places of business.

While the 500 or more persons were waiting in front of the Court House for the trolley cars to take them to the National Cash Register Company's works a local photographer took a picture of the party. Another picture was taken of the party after arriving on the lawn of the company's works by the company's photographer. A flash light was also taken in the woman's dining room at the conclusion of the banquet just previous to adjourning to the assembly hall. The picture taken on the lawn at 4 o'clock was thrown on the screen at the conclusion of the lecture and this was followed by the portrait of President Baker, both of which were a complete surprise to the visitors.

The ladies who accompanied the members to the convention were invited by the National Cash Register Company to inspect its factory at 2 o'clock Wednesday afternoon. They were accompanied by a committee of Dayton ladies as an escort.

A large phonograph of the Peters Arms & Sporting Goods Company of Cincinnati was in commission during

the three days in the corridor of the fourth floor of the hotel, furnishing amusement and pleasure for the visitors.

On Wednesday evening a serenade was given in the hotel lobby by the Heidelberg band, which had been engaged by the Reading Hardware Company.

A large proportion of the exhibitors distributed souvenirs relating to their lines of goods.

For the theater entertainment on Tuesday evening, given by the Dayton merchants, two tiers of boxes on one side the stage and a large block of seats nearby were reserved for the members. The boxes were draped with American flags and the lower tier was decorated with Shovels, Chains, Lanterns, Scythe Snaths, Wire Rat Traps, Cross Cut and Wood Saws, &c. On the front of the upper boxes was a large eagle studded with colored electric lamps, and from the eagle hung a large Padlock, the emblem of the association. A large floral Padlock with the letters O. H. A. in the center was presented to the leading lady on the stage.

This convention was in every respect by far the most successful ever held by the association, both in interest and numbers. Less time was devoted to speeches than usual and more time was given to discussing questions from the Question Box. The officers and members feel greatly encouraged at the prospect of the further growth of the association.

Exhibitors.

The lobby of the Algonquin Hotel presented a gala appearance. Cords were stretched from column to column, upon which were hung posters and signs of the concerns who made exhibits. All the available space in the lobby and also in the adjoining rooms was taken up with exhibits. The exhibits extended from the lobby up to and including the eighth floor. There were more than 80 exhibits, this number being largely in excess of any previous convention. It was suggested that at subsequent conventions the association secure space outside the hotel for exhibitors.

Among the exhibitors were the following:

AKRON SPIRIT LEVEL WORKS, Akron, Ohio, Wm. P. Vrooman.
 ALLERTON-CLARKE COMPANY, New York, B. Baddy.
 AMERICAN CASH REGISTER COMPANY, Alliance, Ohio, D. Case.
 AMERICAN STEEL & WIRE COMPANY, Chicago, Ill., Arthur E. Ward.
 ARRAS CREAM SEPARATOR COMPANY, Bluffton, Ohio, E. P. Percy.
 ART STOVE COMPANY, Chicago, Ill., James Huntley.
 E. C. ATKINS & Co., Indianapolis, Ind., W. E. Jackson.
 ESTATE OF P. D. BECKWITH, Dowagiac, Mich., D. W. Van Antwerp.
 BILLINGS-CHAPIN COMPANY, Cleveland, Ohio, R. S. Reynolds.
 BOSS WASHING MACHINE COMPANY, Cincinnati, Ohio.
 BUFFALO OIL, PAINT & VARNISH COMPANY, Buffalo, N. Y., Karne Ferguson.
 BUCKEYE ALUMINUM COMPANY, Doylestown, Ohio.
 CENTRAL MITER COMPANY, Indianapolis, Ind.
 CHAMPION STEEL RANGER COMPANY, Cleveland, Ohio, John A. Herbst.
 CLEVELAND WINDOW GLASS COMPANY, Cleveland, Ohio, H. A. Hulbert.
 COLUMBUS HARDWARE COMPANY, Columbus, Ohio.
 COLE MFG. COMPANY, Chicago, Ill.
 CONDE IMPLEMENT COMPANY, Indianapolis, Ind., Will Cumbach, Jr.
 CLYDE CUTLERY COMPANY, Clyde, Ohio, Robert B. Jones.
 CRIBBEN & SEXTON STOVE COMPANY, Chicago, Ill., D. E. Magee.
 DIAMOND SPIRAL COMPANY, Chicago, Ill.
 DOVER MFG. COMPANY, Canal Dover, Ohio.
 DUNLAP MFG. COMPANY, Dunlap, Iowa, H. Kellogg.
 EBY AUTOGRAPHIC REGISTER COMPANY, Dayton, Ohio, L. A. Ely.
 FIEBEGGER HEATING COMPANY, Akron, Ohio, H. J. Hough.
 FOREST CITY PAINT & VARNISH COMPANY, Cleveland, Ohio, F. E. Pile.
 JOSEPH GARDNER, Indianapolis, Ind., L. B. Sherwood.
 JOSIAH GERHART & Co., Dayton, Ohio.
 GEM CITY STOVE COMPANY, Dayton, Ohio, W. E. Rowand.
 GOODELL-PRATT COMPANY, Greenfield, Mass., Wm. P. Vrooman.
 HART & COOLEY, New Britain, Conn., J. H. Robinson.
 HUNT, HELM, FERRIS & Co., Harvard, Ill., G. W. Hamilton.
 IRWIN AUGER BIT COMPANY, Wilmington, Ohio, Wm. P. Vrooman.
 JEWELL & VINSON, Dayton, Ohio, E. R. Wels.
 S. S. JEWETT & Co., Buffalo, N. Y., S. W. Gibson.
 JOHNSON & JENNINGS COMPANY, Cleveland, Ohio, J. C. Brainard.
 JOHNSON FOUNDRY & MACHINE WORKS, Battle Creek, Mich.
 KRAMER BROS. FOUNDRY COMPANY, Dayton, Ohio, Joseph Kramer.
 LAMB WIRE FENCE COMPANY, Adrian, Mich., M. L. Gillen.

LANDERS, FRARY & CLARK, New Britain, Conn.
 LINDSAY LIGHT COMPANY, Chicago, Ill., H. L. Town.
 LOCKWOOD-TAYLOR HARDWARE COMPANY, Cleveland, Ohio, M. C. Repple.
 LOWE BROTHERS COMPANY, Dayton, Ohio, R. B. Duran.
 LYONS SPECIALTY COMPANY, Lyons, Iowa.
 JOSEPH F. MCCOY, New York City, E. G. Tuttle.
 MAJESTIC MFG. COMPANY, St. Louis, Mo., M. F. Ruge.
 MALLEABLE STEEL RANGE MFG. COMPANY, South Bend, Ind., A. Wallin.
 MASSACHUSETTS TOOL COMPANY, Greenfield, Mass., Wm. P. Vrooman.
 MICHIGAN STOVE COMPANY, Detroit, Mich., J. W. Weldon.
 MUELLER FURNACE COMPANY, Milwaukee, Wis., G. C. Mueller.
 NATIONAL PAINT & VARNISH COMPANY, Cleveland, Ohio.
 NATIONAL ROOFING COMPANY, Tonawanda, N. Y., Thomas B. Lehon.
 NATIONAL STOVE COMPANY, Lorain, Ohio.
 NATIONAL SWEEPER COMPANY, Marion, Ind.
 J. M. & L. A. OSBORN COMPANY, Cleveland, Ohio.
 PENINSULAR PAINT & VARNISH COMPANY, Detroit, Mich., Geo. F. Moore.
 PETERS ARMS & SPORTING GOODS COMPANY, Cincinnati, Ohio, D. D. Grass.
 PITTSBURGH STEEL COMPANY, Pittsburgh, Pa., C. T. Burkhard.
 RATHBONE, SAED & CO., Albany, N. Y., F. R. McGrew.
 READING HARDWARE COMPANY, Reading, Pa., W. R. Johnston.
 REED MFG. COMPANY, Newark, N. Y., W. G. Olmstead.
 RICHMOND CEDAR WORKS, Richmond, Va.
 ROBESON CUTLERY COMPANY, Rochester, N. Y., G. A. Teller.
 ROCHESTER STAMPING COMPANY, Rochester, N. Y.
 SHELBY SPRING HINGE COMPANY, Shelby, Ohio, J. D. Rader.
 SIMONDS MFG. COMPANY, Chicago, Ill., R. H. Newman.
 C. F. SMITH & CO., De Kalb, Ill.
 STANDARD LIGHTING COMPANY, Cleveland, Ohio, C. E. Bartenbach.
 STERLING COLOR WORKS, Dayton, Ohio.
 STAMFORD GAS STOVE COMPANY, Stamford, Conn., Geo. H. Vroom.
 SPOTLESS WASHING MACHINE COMPANY, Richmond, Va., William Todd.
 THRESHER VARNISH COMPANY, Dayton, Ohio, John A. Pfanner.
 VOSS BROS. MFG. COMPANY, Davenport, Iowa, C. E. Mearns.
 F. E. WELLS & SON COMPANY, Greenfield, Mass., Wm. P. Vrooman.
 IRA F. WHITE & SON, Newark, N. J., B. Lurie.
 WHITE LILY WASHER COMPANY, Davenport, Iowa, Sam T. White.
 WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.

Among other interests personally represented but having no exhibits were the following: Hibbard, Spencer, Bartlett & Co., Chicago, Ill., Alford P. Rutter; Waterbury Company, New York, A. L. Sykes, and McIntosh Hardware Corporation, Cleveland, Ohio, James B. Carson.

STANLEY RULE & LEVEL COMPANY'S NEW CATALOGUE.

THE STANLEY RULE & LEVEL COMPANY, New Britain, Conn., and 107 Chambers street, New York, has just issued a fine new illustrated catalogue, No. 31, of 77 pages, each 9 x 11 inches, containing large lines of fine mechanics' tools for workers in wood and metals. The paper used is a duplicate in color of that covering the boxes containing the goods and the covers resemble the labels. In addition to the wide assortments for which the company is well known, including Rules, Plumbs and Levels, Squares, Bevels, Gauges, Planes, Miter Boxes, Spoke Shaves, Plumb Bobs and many other goods, there are a large number of entirely new goods and improvements on otherwise staple lines. New with it are various styles of Round Blade Screw Drivers, Bit Braces both plain and with concealed ratchets, Low Angle Spoke Shaves, Bit Gauges, Chute Board, important improvements in the Bailey Plane, &c. With each catalogue is a condensed price-list, with discounts in red in connection with each line. A reproduction of the book will be made in much smaller compass for convenient handling.

BEGINNING with the new year what was formerly the *Hardware Dealer*, published weekly in Montreal, became the *Hardware Dealers' Monthly*, which, as its name implies, is issued once a month. The publishers, the Canadian Trade Journals, Limited, Montreal, feel that the interests of their readers can be better served with a monthly than a weekly publication. The issue before us contains a variety of useful information in regard to general trade conditions in Canada, especially as they relate to Hardware interests.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

THE annual meeting of the New England Hardware Dealers' Association will be held at the Hotel Vendome, Boston, Wednesday, March 15, and the committee in charge has perfected plans which assure what will probably prove the most successful occasion of its kind in the history of the association. The day's business will begin with a luncheon of the Board of Directors, after which the members of the board will hold a business meeting, which will be followed by the annual meeting at 1.30 o'clock, at which officers will be elected for the year. At 4 o'clock there will be a smoker, at which visiting manufacturers and jobbers will be guests. The evening will be a time of social pleasure, in which the ladies will join. A reception will be given at 6.30 o'clock, after which a banquet will be served, the after dinner features assuring much instructive entertainment. The after dinner guests will include Attorney-General Herbert Parker of Massachusetts, George W. Corbin of the Corbin Cabinet Lock Company, Rev. James Eells, pastor of the First Church of Boston; R. R. Williams, Hardware Editor of *The Iron Age*; Hayes Robbins, secretary of the New England branch of the Welfare Department of the National Civic Federation, and President Samuel A. Bigelow of the National Hardware Association. President Charles E. Adams of the Massachusetts State Board of Trade, an officer of the association, will be the toastmaster. The three State reception rooms will be opened to manufacturers who wish to make exhibits. Next day will be given up to social pleasures, including a visit to the Automobile Show as guests of the managers.

WHITE ENAMELED REFRIGERATOR COMPANY.

THE WHITE ENAMELED REFRIGERATOR COMPANY, St. Paul, Minn., has issued a very handsome 60-page catalogue of its Bohn's patent dry air siphon system Refrigerators. In a chapter on air circulation the company describes the mechanism of this system in detail. The right-hand pages of the book are devoted to illustrations and specifications of the various styles of Refrigerators made by the company, while the left hand pages contain text descriptive of its mechanical and sanitary features, followed by autograph testimonials.

REGENHARDT'S INTERNATIONAL GUIDE.

C. REGENHARDT, W., Kurfürstenstr. 143, Berlin, Germany, and I. Opernring 15, Vienna, Austria, whose sale agent for America and Australia is F. L. Beck, 11 Broadway, New York, has just issued the thirtieth edition of Regenhart's "International Guide for Merchants, Manufacturers and Exporters." It is very compact and in condensed form, contains nearly 700 pages on thin, strong paper, weighs but nine ounces and is moderate in price. It contains much wanted information regarding shipping intercourse, consular and customs service, number of inhabitants, leading banks and law firms, commission and forwarding agents in places of any importance throughout the world. The arrangement is such as to give much valuable information of the above and kindred character in small compass.

E. ROSENBAUM, who for ten years has been in the employ of Sargent & Co., New York—the last two years in their city sales department—has just started in business for himself, with an office at 88 Chambers street, New York. He will represent manufacturers to the trade in and about this city in marketing Hardware Novelties and Specialties. Mr. Rosenbaum is a grandson of one of the senior partners in M. & L. Samuel, Benjamin & Co., Toronto, Canada, who are well known in the Hardware trade.

Davis & McLaughlin have succeeded Slade & McLaughlin in the Hardware and Implement business at Cozad, Neb.

Myers Ratchet Handle Pumps.

F. E. Myers & Bro., Ashland, Ohio, have recently brought out a line of ratchet handle pumps, to which they allude as a pronounced change in design, construc-



Fig. 1.—Submerged Cylinder Double Acting Force Pump.

tion and mechanism, meeting the requirement equally well for shallow or deep wells, and at the same time easy in operation. There are four styles—viz., single acting force, double acting force, tubular well stand and lift, the illustrations showing the last three patterns. The han-



Fig. 2.—Tubular Well Stand.

dles are of such construction that the ordinary pump dealer, when driving extremely deep wells, can lengthen the handle to balance the weight of the actuating rod, thus enabling the pump setter to adjust the handle always

to such weight as will facilitate the operation of the pump. Outwardly the ratchet handle single acting force pump is represented by Fig. 3, which here illustrates the lift pump, the difference being in the arrangement of valves. The single acting pump has adjustable base, wrought steel handle, patent glass valve seat and poppet valve. The advantage of the ratchet or cog gear head is that it allows the piston to move in a direct line without swaying from side to side, as occurs with an ordinary handle, and it also makes unnecessary, it is said, links, friction guides, &c. The pump rod opposite the handle contacts with a roller bearing which reduces friction to a minimum. This style head gives an 8-inch stroke with 3-inch fulcrum, as against a 6-inch stroke and 5½-inch fulcrum. The extra leverage adapts the pump to very deep wells, and the handle can be of any length by using ordinary wrought steel pipe. The spout is attached to the pump head by using a union nut, making it reversi-



Fig. 3.—Lift Pump with Adjustable Base.

ble, as in a double acting force pump, and the special construction of this pump head causes, it is claimed, water to flow from the spout in a smooth, continuous, even stream. The base is adjustable and can be located at any desired point. Fig. 1 represents the submerged cylinder double acting force pump, to which many of the foregoing features apply. The base of the pump is hollow, with a pipe running through the center for the pump rod to pass through, making the base an air tight chamber, which forms a part of the air chamber. The handle bearer is a wrought steel tube, forming a handle support and completing the air chamber. The upper cylinder is a seamless drawn brass tube inclosed in an iron shell and is connected to base by a 1½-inch pipe. There are six styles of this pump, adapted to 3, 3½, 3¾, 4, 4½ and 5 inch cased wells. The pumps are suited to wells from 10 feet deep to 60, 75 and 150 feet, and have capacities variously of 306, 440 and 600 gallons an hour. The cylinders are tapped for both 1¼ or 1½ inch pipe, according to the selection. Fig. 2 shows the tubular well stand for tubular or other wells. This pump has an 8-inch stroke and 3-inch fulcrum, and the general construction of stand is exactly the same as their regular tubular well stand, and it can also be fitted with cock spout and back outlet, as is also regularly done with some of their standard pumps. It is tapped for 2-inch pipe and bushed for 1½ and 1¼ inch pipe. Fig. 3 is a lift pump of the same general character. This pump also has a smooth, even stream

delivery, similar to that of double acting force pumps. It is made in six styles, with brass lined and entire brass cylinders $2\frac{1}{2}$, 3 and $3\frac{1}{2}$ inches in diameter, and capacities of 300, 440 and 600 gallons an hour.

Coolidge Adjustable Wrench.

The Hudson Parer Company, Leominster, Mass., for which the Livingston Nail Company, 104 Reade street, New York, is sole selling agent, has put on the market the Coolidge patented adjustable bit brace wrench here illustrated. Fig. 1 represents the article as marketed, which



Fig. 1.—Coolidge Adjustable Nut or Lag Screw Wrench.

is packed singly in an attractive box, Fig. 2 indicating the easy way of instantaneously catching a nut, lag screw or similar head for turning within the limit of 1 inch square and down to 7-16 inch. On one side is a thumb lug riveted to the jaws' bottom, which is pushed forward to grasp the nut, lag screw, &c., against a $\frac{1}{4}$ -inch steel spiral spring, which causes the jaws to grip firmly whatever is being screwed or unscrewed. The rapidity with which such work can be accomplished in connection with

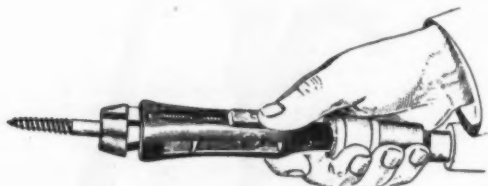
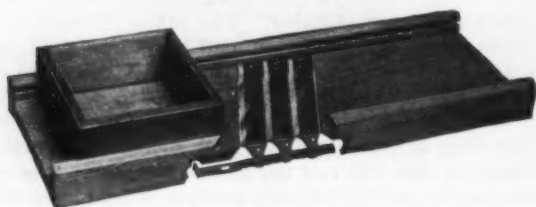


Fig. 2.—Method of Operation.

any bit brace makes it valuable to blacksmiths, line-men, mechanics of various kinds, and especially those who assemble agricultural and other machinery. It will carry a nut or lag screw, either of which can be dropped by a pressure on the thumb lug. The wrench is made of cast metal, with jaws and lug ground, body finished in japan, and is $7\frac{1}{4}$ inches long over all.

Vegetable, Slaw and Kraut Cutters.

O. E. Thompson & Sons, Ypsilanti, Mich., are manufacturing a new type of kraut, slaw and vegetable cutters, as here shown. All the tool steel knives can be set at one operation by merely loosening a thumb nut and moving a lever backward or forward. This operation of the knives (there being eight styles on this principle, having variously two, three and four knives) at once effects perfect uniformity of pitch of blades, besides a great



Improved Kraut Cutter.

saving of time. By tilting the knives up high they can be sharpened without removal, and as there are neither slots nor holes there are no crevices to become filled or clogged with vegetable matter. The eight sizes range in size from 8 x 26 inches, No. 50, with two knives, up to No. 80, 12 x 40 inches, with four knives. The wood is

extra quality white sugar maple, with a provision in construction to prevent warping.

Spring Calipers and Adjustable Dividers.

The Athol Machine Company, Athol, Mass., manufacturer of lines of mechanics' fine tools, has just introduced the Premier outside spring calipers and extension dividers here illustrated. Fig. 1 shows characteristics of a line embodying the same principles, applied also to inside spring calipers, spring dividers, two types of thread spring calipers, keyhole spring calipers, straight



Fig. 1.—Premier Outside Spring Calipers.

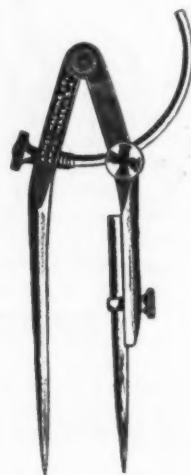
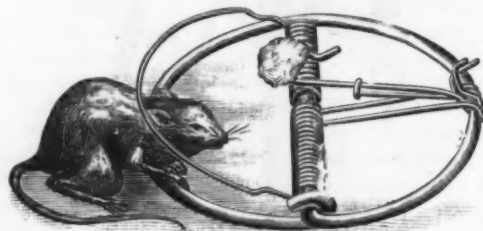


Fig. 2.—Extension Dividers.

leg spring and Hermaphrodite spring calipers. Many of them are made in six sizes, from $2\frac{1}{2}$ to 8 inches, inclusive, with both quick nut and solid nut, the latter being more moderately priced. The thread calipers are made in 3, 4 and 5 inch sizes, keyhole and straight leg calipers 3 and 4 inch, and Hermaphrodite calipers are 3 to 6 inches long. The quick nut is recommended by the company for rapidity and accuracy of adjustment. Fig. 2, extension dividers, has one drop forged leg and one malleable iron leg, with tool steel points well tempered. The adjustable point can be instantly removed and a pencil inserted in place of it. The sizes are 6, 8 and 10 inches in length.

Ideal Self Setting Mouse Trap.

The Hatheway Mfg. Company, Bridgeport, Conn., has put out the Ideal self setting mouse trap here illustrated. It is made entirely of wire; therefore is odorless as well as cleanly and sanitary. The company alludes to the



Ideal Self Setting Mouse Trap.

ease and effectiveness with which the trap operates, while the simplicity of construction minimizes the liability of its getting out of order. The trap can be retailed profitably at a very low price.

W. T. Godfrey has succeeded W. T. Godfrey & Co., dealers in Hardware and Stoves, Shoshone, Idaho. Mr. Godfrey has added the sale of Paints, Oils, Varnishes and Sporting Goods.

Sill Pneumatic Horse Collar.

The Sill Pneumatic Horse Collar Company, Bloomington, Ill., is just putting on the market the Sill pneumatic collar, as here shown. The salient and important feature is the pneumatic principle worked out in connection with a metallic front which keeps the collar rigid

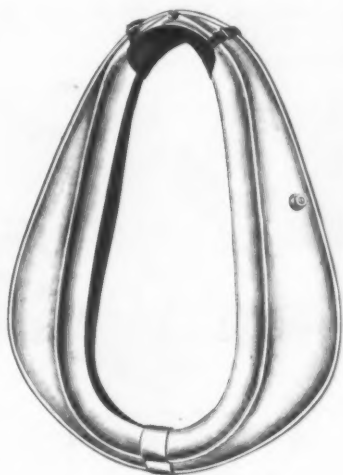


Fig. 1.—Sill Pneumatic Horse Collar, Front.

and holds the soft air chamber in proper place, thus automatically distributing the draft all along the shoulders of the animal instead of throwing a large proportion of it on the point of contact or lower part of the shoulders. Fig. 1 illustrates the collar, metal side front, and Fig. 2 is a sectional view showing the air chamber or interior partly exposed. The collar is obviously self adjustable, the face or leather portion being treated with a preparation that the company guarantees to be impervious to sweat, water or grease, that will not get hard or crack and greatly increases its life. Another feature



Fig. 2.—Sectional View, Pneumatic Side.

of this mode of construction is that the collar absorbs the shock or concussion when starting a load and prevents the occurrence of jars and jerks from the vehicle on rough roads or streets, obviating the necessity for sweat pads, which often soften and gail the shoulders. The rubber tube is covered with a water proof canvas bag, which takes all strain from the rubber and leather and affords the rubber increased protection against foreign substances of injurious character. The air tube is filled through the small valve seen at the right of Fig. 1. The metallic part of the collar is of high grade sheet steel, properly tempered, and the collar is fastened at the bottom with a strong invisible spring, making it easy to take apart or put together. At first the company will run largely on 18, 20 and 22 inch draft sizes in enamel finish, but as fast as the machinery is installed all sizes

and the various popular shapes will be made in oxidized, japanned, enameled, silver and nickel, brass and gold finishes.

Prisco Movable Front Sink Strainer.

The Pritchard-Strong Company, Rochester, N. Y., has just put on the market the Prisco movable front sink strainer, as here shown. It is made substantially of sheet steel and is held to the beveled side of the sink

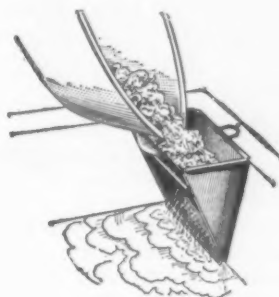


Fig. 1.—Prisco Movable Front Sink Strainer.

by a nail or screw, as seen in Fig. 1, although, if so ordered, it can be furnished with a leg instead of ring, so as to stand independently in any part of the sink. Fig. 1 illustrates it as receiving peelings or other refuse mixed with water from a pan, the water passing through the



Fig. 2.—Pressing Liquid from Mass.

perforations and the drain pipe without danger of clogging it. Fig. 2 is a representation of the act of pressing any remaining liquid from the mass by forcing the movable side against the solid matter, thus better fitting it for garbage pail or cremation in range. If put out as



Fig. 3.—Scraping Compact Mass Into Receptacle.

garbage there is but little liquid to freeze in times of low temperature. Fig. 3 shows the facility with which the retained solids can be scraped from the strainer into a pail if necessary. It is designed for retelling profitably at 10 cents.

The annual election of the stockholders of the Mangan Hardware Company, Beresford, S. D., resulted in the election of the following officers for the coming year: President, J. Mangan; vice-president, M. M. Mangan; secretary-treasurer, M. V. Mangan.

Westcott's Patent Little Giant Auxiliary Screw Drill Chuck.

Westcott Chuck Company, Oneida, N. Y., is offering the chucks shown in the accompanying cuts, in various sizes. The auxiliary screws in the chuck, Fig. 1, over-



Fig. 1.—Westcott's Little Giant Auxiliary Screw Drill Chuck.

come any tendency of the inner or gripping part of the jaws to crowd away from the right and left hand screw, or the outer end of the jaws to draw toward the right and left hand screws. After the jaws are closed on a



Fig. 2.—Parts of Chuck in Fig. 1.

drill in the usual manner by turning the right and left hand screw the auxiliary screw is tightened, which increases the gripping power of the chuck. The effect of the auxiliary screw is similar to that of a bolt, as it

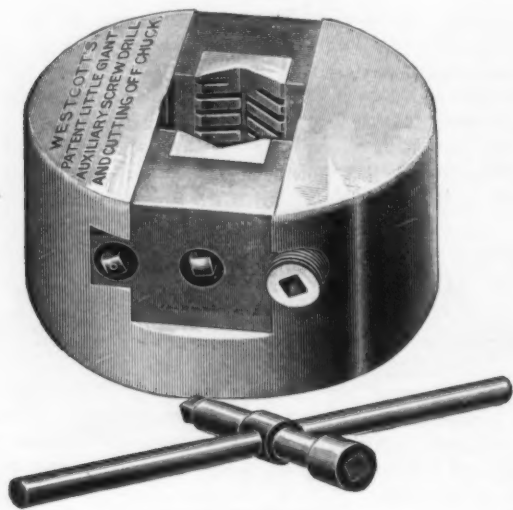


Fig. 3.—Larger Size of Chuck.

virtually bolts the two jaws together. The pattern of chuck shown in Figs. 1 and 2 is made in $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch sizes. The hole in the hub is made to fit the Morse taper,

but can be bored out and threaded to suit the customer's templet at small cost. These chucks are also furnished with straight bodies, which are especially adapted to hollow spindle lathes for holding rods, round or square, which are to be turned or cut off. The $1\frac{1}{2}$ -inch and larger sizes are made of the pattern shown in Figs. 3 and 4 in

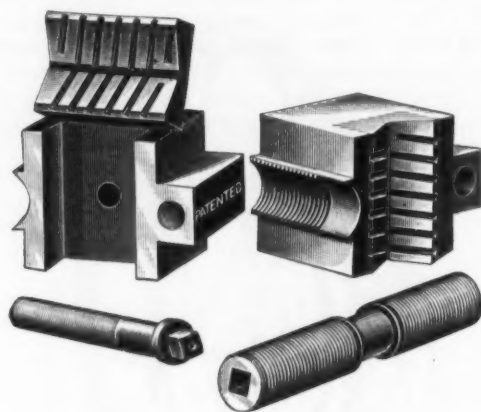


Fig. 4.—Parts of Chuck in Fig. 3.

six sizes and are designed for hollow spindle lathes, screw machines, turret head lathes and cutting off machines to take the place of more expensive lathe chucks. In sizes $1\frac{1}{2}$ -inch to 4-inch, inclusive, of the regular auxiliary screw chucks, the V-blocks in the jaws hold round, square and hexagon shanks.

Ash Barrel and Ash Can Truck.

The truck shown in the accompanying illustration is especially adapted for moving ash barrels and ash cans, though its use for other similar purposes is obvious. It is made entirely of steel, light and strong. The wheels are of sufficient size and are set well apart so that the barrel will not tip over. A sliding dog runs



Ash Barrel and Ash Can Truck.

easily up and down on the frame of the handle and is held in place when desired by a spring which bears against the sides of the handle. The two prongs at the bottom are easily pushed underneath the barrel. The operation is to insert the prongs, push the handle up against the barrel and slide down the dog until it catches hold of the upper edge of the barrel. Pulling back on the handle balances the barrel on the truck. It is manufactured by the Knowles Scale Works, Fletcher street, Liberty square, Lowell, Mass.

Goulds Combination Pumping Head.

The Goulds Mfg. Company, Seneca Falls, N. Y., has put on the market Goulds' new combination pumping head, which is here illustrated. It is intended for wells 100 to 200 feet deep, and is said by the makers to be a very compact, strong machine for operating pumping cylinders by either hand power, wind mill or belt from line shaft, motor or engine. The stroke is adjustable



Goulds Combination Pumping Head.

6, 8 or 10 inches. It has a large air chamber and a compression bib spout fitted for hose, and there is an opening back of the spout for connecting an iron pipe. The hand lever is long and powerful. A strong brace is furnished to bolt to the standard and well cover to make the head rigid. The well pipe screws into the base just below the stuffing box, through which the polished well rod operates. By removing two bolts that secure the stuffing box and disconnecting well rod from the cross head a 2½-inch plunger can be drawn up through the base without removing the head or disturbing the piping, which is a very desirable feature in case the cylinder plunger needs repacking. For mechanical power it is geared 8½ to 1. A tight and loose pulley 8 x 2½ is supplied which operates the double reduction gears, which are well and carefully made. All bearings are of

Babbitt metal and provided with grease boxes for lubrication, making a very smooth, easy running machine of great durability. For maximum capacity and depth about a 2½ horse-power gasoline engine is required. Change of power can be easily effected. For hand use remove a slip pin from the cross head, disconnecting the connecting rod and gearing, and the hand lever then operates directly on the well rod. For wind mill this same slip pin is removed, disconnecting the gearing, and the hand lever is detached from the wind mill rod by removing another slip pin. The wind mill then operates directly on the well rod. If belt power is used the hand lever is disconnected from the well rod and the pulley drives the gearing which, in turn, operates the connecting rod, cross head and well rod.

Read's Rein Specialties.

O. B. Read Mfg. Company, Troy, N. Y., has recently put on the market, supplementing its rein supporter, Read's rein holder and rein fastener, as here shown. The rein holder is applied to that portion of the harness



Rein Holder.



Rein Fastener.

which supports the breast band, requiring but a simple twist of the rein to keep it in place so that it stays there, preventing accidents from reins catching under shaft ends. They are simple, convenient and attractive and finished in nickel or imitation rubber. The rein fastener is an attachment for the inward side of dashboard to hold any thickness of rein instantly when stepping from the vehicle, and can be attached behind whip and out of sight. This device secures the reins, keeps them from under the horses' feet and prevents soiling as well as accident. The finish is high grade imitation rubber.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9½ @ 9½
Lead, American white, in Oil:	
Lots of 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
in Barrels.....	@ 8
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	@ 1
Lead, White, in oil, 12½ lb tin	
pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb	
ass'ted tins, add to keg price ..	@ 1¼
Lead, American, Terms: For lots 12	
tons and over ¼¢ rebate; and 2¢ for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2¢ for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	@ 6
Lead, White, Dry in bbls.....	@ 6
Zinc, American, dry.....	4½ @ 4½
Zinc, French:	
Paris, Red Seal, dry.....	8½
Paris, Green Seal, dry.....	8½
Antwerp, Red Seal, dry.....	7½
Antwerp, Green Seal, dry.....	8½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	11½ @ 12½
Lots of less than 1 ton.....	12½ @ 12½
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over.....	10½ @ 11½
Lots of less than 1 ton.....	10½ @ 11½
Discounts—French. Zinc.—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades, 1%; 25 bbls, 2%; 50 bbls, 4%.	

Dry Colors—

Black, Carbon.....	5 @ 10
Black, Drop, Amer.....	4 @ 6
Black, Drop, Eng.....	5 @ 15
Black, Ivory.....	16 @ 20
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	2 @ 32
Blue, Prussian.....	2 @ 30
Blue, Ultramarine.....	4½ @ 15
Brown, Spanish.....	1 @ 1
Carmine, No. 40.....	3.55 @ 4.00
Green, Chrome, ordinary.....	3½ @ 4

Green, Chrome, pure.....	17 @ 25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
Litharge, bbls., ½ bbls. and kegs:	
Lots 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
Ocher, American.....	@ 10 \$8.50 @ 16.00
Orcher, American Golden.....	2½ @ 3¼
Orcher, French.....	1¼ @ 2¼
Orcher, Foreign Golden.....	3 @ 4
Orange Mineral, English.....	8½ @ 10½
Orange Mineral, French.....	10½ @ 11½
Orange Mineral, German.....	7½ @ 10
Orange Mineral, American.....	8 @ 8¼
Red, Indian, English.....	4½ @ 8¼
Red, Indian, American.....	3 @ 3¼
Red, Turkey, English.....	4 @ 10
Red, Tuscan, English.....	7 @ 10
Red, Venetian, Amer.....	@ 100 \$0.50 @ 1.25
Red Venetian, English.....	@ 100 \$1.15 @ 1.75
Sienna, Italian, Burnt and	
Powdered.....	3 @ 9½
Sienna, Ital., Raw. Powd.....	3 @ 6½
Sienna, American, Burnt and	
Powdered.....	1¼ @ 2
Talc, French.....	@ 100 \$20.00 @ 30.00
Talc, American.....	@ 100 \$16.00 @ 25.00
Terra Alba, French.....	@ 100 \$0.10 @ 1.00
Terra Alba, English.....	@ 100 \$0.90 @ 1.00
Terra Alba, American.....	@ 100
lb. No. 1.....	60 @ 70
Terra Alba, American.....	@ 100
lb. No. 2.....	45 @ 50
Umber, T'key, Bnt. & Pow.....	2½ @ 3¼
Umber, Turkey, Raw & Pow.....	2½ @ 3¼
Umber, Burnt, Amer.....	1¼ @ 2
Umber, Raw, Amer.....	1½ @ 2
Yellow, Chrome.....	11 @ 16
Vermilion, American Lead.....	10 @ 25
Vermilion, Quicksilver, bulk.....	@ 65
Vermilion, Quicksilver, bags.....	@ 65
Vermilion, English, Import.....	75 @ 80
Vermilion, Chinese.....	\$0.90 @ 1.00

Colors in Oil—

Black, Lampblack.....	12 @ 14
Blue, Chinese.....	26 @ 46
Blue, Prussian.....	32 @ 36
Blue, Ultramarine.....	13 @ 16
Brown, Vandyke.....	11 @ 14

Green, Chrome.....	10 @ 15
Green, Paris.....	@ 24
Sienna, Raw.....	12 @ 15
Sienna, Burnt.....	12 @ 15
Umber, Raw.....	11 @ 14
Umber, Burnt.....	11 @ 14

Miscellaneous—

Barytes, White, Foreign.....	@ 100 \$17.50 @ 19.00
Barytes, Amer. floated.....	@ 100 \$17.00 @ 18.50
Barytes, Crude, No. 1.....	@ 100 \$10.00 @ 11.00
Chalk, in bulk.....	@ 100 \$3.00 @ 3.25
China Clay, English.....	@ 100 \$11.00 @ 17.00
Cobalt, Oxide.....	@ 100 \$2.50 @ 3.00
Whiting, Common.....	@ 100 \$4.50 @ 4.8
Whiting, Gilders.....	@ 100 \$5.50 @ 5.8
Whiting, Ex. Gilders.....	@ 100 \$6.50 @ 6.8

Putty—

In bladders.....	\$1.65 @ 1.70
In bulk.....	1.05 @ 1.15
In cans, 1 lb to 5 lb.....	2.00 @ 2.90
In cans, 12½ to 50 lb.....	1.90 @ 1.55

Spirits Turpentine—

In Oil bbls.....	54 @ 54½
In machine bbls.....	54½ @ 55

Glue—

Cabinet.....	11 @ 15
Common Bone.....	8 @ 8
Extra White.....	15 @ 25
Foot Stock, White.....	11 @ 14
Foot Stock, Brown.....	7 @ 10
German Hide.....	12 @ 18
French.....	10 @ 10
Irish.....	13 @ 16
Low Grade.....	8 @ 11
Medium White.....	14 @ 17

Gum Shellac—

Bleached Commercial.....	33 @ 34
Bone Dried.....	43 @ 44
Buton.....	36 @ 45
Diamond L.....	33 @ 43
Fine Orange.....	43 @ 45
A. C. Garnet.....	36 @ 40
D. C.....	@ 40
Octagon B.....	50 @ 50
T. N.....	35 @ 36

V. S. O.....

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	47 @ 48
Linseed, City, boiled.....	49 @ 50
Linseed, State and West'n, raw.....	45 @ 46
Linseed, raw Calcutta seed.....	45 @ 46
Lard, Prime, Winter.....	56 @ 58
Lard, Extra No. 1.....	48 @ 49
Lard, No. 2.....	36 @ 38
Cotton-seed, Crude, f.o.b. mills.....	16 @ 17
Cotton-seed, Summer Yellow,	
Prime.....	24 @ 24½
Cotton-seed, Summer Yellow,	
off grades.....	21 @ 24½
Sperm, Crude.....	60 @ 61
Sperm, Natural Spring.....	@ 61
Sperm, Bleached Spring.....	@ 61
Sperm, Natural Winter.....	62 @ 64
Sperm, Bleached Winter.....	65 @ 67
Tallow, Prime.....	68 @ 69
Whale, Crude.....	@ 69
Whale, Natural Winter.....	45 @ 46
Whale, Bleached Winter.....	47 @ 48
Menhaden, Brown, Strained.....	27 @ 28
Menhaden, Light, Strained.....	28 @ 29
Menhaden, Bleached Winter.....	30 @ 32
Menhaden, Ex-Bld, Winter.....	32 @ 33
Menhaden, Southern.....	19½ @ 20
Cocoonut, Ceylon.....	@ 100 \$6.00 @ 6½
Cocoonut, Cochiti.....	@ 100 \$7.00 @ 7½
Cod, Domestic, Prime.....	36 @ 38
Cod, Newfoundland.....	39 @ 41
Red Blaine.....	31 @ 33
Red Saponified.....	@ 100 \$4.00 @ 4½
Olive, Italian, bbls.....	54 @ 58
Neatsfoot, prime.....	50 @ 51
Palm, prime Logos.....	@ 100 \$4.00 @ 4½

Mineral Oils—

Black, 28 gravity, 25 @ 30 cold	gal. test.....
Black, 29 gravity, 15 cold test.....	10½ @ 11¼
Black, Summer.....	10½ @ 11¼
Cylinder, light filtered.....	18 @ 19
Cylinder, dark filtered.....	16 @ 17
Paraffine, 90-97 gravity.....	12½ @ 13
Paraffine, 90-93 gravity.....	11½ @ 12
Paraffine, 88-93 gravity.....	9½ @ 9½
Paraffine, Red.....	11½ @ 13
In small lots ¼¢ advance.	

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 1/2 @ 33 1/2 & 10% signifies

that the price of the goods in question ranges from 33 1/2 per cent. discount to 33 1/2 and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, \varnothing doz. \$3.00.....33 1/2
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils..... \varnothing lb 7 1/4 @ 7 1/4
Hay-Budden, Wrought.....9 1/4 @ 9 1/4
Horseshoe brand, Wrought.....9 1/4 @ 9 1/4
Trenton..... \varnothing lb 9 1/4 @ 9 1/4

Imported—

Peter Wright & Sons..... \varnothing lb 10 1/4 @

Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15 & 10%

Apple Parers—

See Parers, Apple, &c.

Aprons, Blacksmiths'—

Hull Bros. Co.....30 & 10%
Livingston Nail Co.....33 1/2

Augers and Bits—

Com. Double Spur.....70 & 10%
Boring Mach. Augers.....70 & 10%
Car Bits, 12-in. twist.....50 & 10%
Jennings' Pattern.....70 & 10%
Ford's Auger and Car Bits.....40 & 5%
Forster Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25%
No. 30, R. Jennings' list.....40 & 7 1/2
Russell Jennings.....25 & 10 & 2 1/2
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....30 & 10%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40 & 10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60 & 10%
Wright's Jennings' Bits (R. Jennings' list).....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$18; large, \$28.....50 & 10%
Clark's Pattern, No. 1, \varnothing doz. \$28.....50 & 10%
No. 2, \$18.....50 & 10%
Ford's, Clark's Pattern.....50 & 10%
C. E. Jennings & Co., Steer's Pat.....25%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut..... \varnothing doz. \$3.00 @ \$3.25
German Pattern, Nos. 1 to 10, \$4.60; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$9.00 @ 10.00
Ames.....25 & 10%
New Patent.....25 & 10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15%
Watrous'.....35 & 5%
Ohio Tool Co.'s.....40%
Snell's.....40%

Awl Hafts—

See Hafts, Awl.

Awls—

Handled..... \varnothing doz. \$2.75 @ \$3.00
Unhanded, Rhidered..... \varnothing doz. \$2.63 @ \$2.66
Unhanded, Patent..... \varnothing doz. \$2.66 @ \$2.69
Peg Awls:
Unhanded, Patent..... \varnothing doz. \$1 @ \$1.14
Unhanded, Rhidered..... \varnothing doz. \$1 @ \$1.14
Scratch Awls:
Handled, Com..... \varnothing doz. \$3.50 @ \$4.00
Handled, Socket..... \varnothing doz. \$11.50 @ \$12.00
Hurwood.....40%

Awl and Tool Sets—

See Sets, Awl and Tool.

Axes—

Single Bit, base weights. (up to 3 1/2 lb.)
First Quality.....\$6.50
Second Quality.....\$6.00

NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar..... \varnothing doz. \$4 @ \$4.14
Concord, Solid Collar..... \varnothing doz. \$4 @ \$4.14
No. 1 Com., Loose..... \varnothing doz. \$4 @ \$4.14
No. 1 1/2 Com., New Style..... \varnothing doz. \$4 @ \$4.14
No. 2 Solid Collar..... \varnothing doz. \$4 @ \$4.14
Nos. 7, 8, 11 and 12.....75 @ 75 & 5%
Nos. 13 to 14.....70 @ 70 & 5%
Nos. 15 to 18.....75 @ 75 & 10%
Nos. 19 to 22.....75 @ 75 & 10%
Iron or Steel

Boxes, Axle—

Common and Concord, not turned.....10.45 @ 5%
Common and Concord, turned.....10.45 @ 5%
Half Patent.....10.50 @ 6%
lb. 8 1/2 @ 9 1/4

Bait—

Fishing—
Hendryx.....20%
B Bait.....25%
Competitor Bait.....20 & 5%

Balances—

Caldwell new list.....50%
Pullman.....50 & 10 @ 60%

Spring—

Spring Balances.....60 @ 60 & 5%
Chatillon's:
Light Spg. Balances.....40 & 10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....50%

Barb Wire—

See Wire, Barb.

Bars—

Crow—
Steel Croubars, 10 to 40 lb..... \varnothing doz. 2 1/2 @ 3 1/4

Towel—

No. 10 Ideal, Nickel Plate..... \varnothing doz. \$3.50

Beams, Scale—

Scale Beams.....40 & 10 @ 50%
Chatillon's No. 1.....40%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered \varnothing doz. \$0.85;
Tinned.....\$1.00
No. 11 Wire Coppered \varnothing doz. \$1.10;
Tinned.....\$1.20
No. 10 Wire Galvanized..... \varnothing doz. \$1.75
Western W. G. Co.:
No. 1 Electric..... \varnothing doz. \$7.80
No. 2 Buffalo..... \varnothing doz. \$9.00
No. 3 Perfection Dust..... \varnothing doz. \$3.00

Egg—

Holt-Lyon Co.:
Holt, No. A. Japanned..... \varnothing doz. \$1.20
Holt, No. 1, Tinned..... \varnothing doz. \$1.50
Holt, No. B. Japanned..... \varnothing doz. \$2.00
Holt, No. 2, Tinned..... \varnothing doz. \$2.25
Lyon, No. 2, Japanned..... \varnothing doz. \$1.25
Lyon, No. 3, Japanned..... \varnothing doz. \$1.50
Taplin Mfg. Co.:
No. 60 Improved Dover.....\$6.00
No. 75 Improved Dover.....\$6.50
No. 100 Improved Dover.....\$7.00
No. 102 Improved Dover, Tin'd.....\$3.50
No. 150 Improved Dover, Hotel.....\$15.00
No. 152 Imp'd Dover, Hotel, T'd.....\$17.00
No. 200 Imp'd Dover Tumbler.....\$8.50
No. 202 Imp'd Dover Tumbler, T'd.....\$9.50
No. 300 Imp'd Dover Mammoth.....\$25.00
Western, W. G. Co., Buffalo.....\$7.00
Wonder (S. S. & Co.), \varnothing doz. net, \$6.00

Bellows—

Blacksmith, Standard List.....60 & 10 @ 70 & 10%

Blacksmiths'—

Inch. 30 32 34 36 38 40
Each \$3.25 3.50 4.00 4.50 5.00 5.75
Extra Length:
Each \$3.75 4.25 4.75 5.25 6.00 7.00

Hand—

Inch. 6 7 8 9 10
Doe. \$4.50 5.00 5.50 6.00 6.50

Molders—

Inch. 9 10 11 12 14
Doe. \$8.00 9.00 10.50 12.50 14.50

Bells—

Ordinary goods.....75 & 5 @ 75 & 10 & 5%
High grade.....70 & 10 @ 70 & 10 & 5%
Jersey.....75 & 10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55 & 10%
Lever and Pull, Sargent's.....60 & 10%
Trip Gong.....50 & 10 @ 50 & 10 & 5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....60 & 5 @ 60 & 10 & 5%
White Metal.....60%
Nickel Plated.....50 & 10 @ 50 & 10 & 5%
Swiss.....60 @ 60 & 7 1/2
Cone's Globe Hand Bells.....33 & 5 @ 33%
Silver Chime.....33 & 5 @ 33%

Miscellaneous—

Farm Bells.....10.25 @ 11%
Steel Alloy Church and School.....50 & 10 @ 50 & 10 & 5%
American Tube & Stamping Co.:
Gongs.....75%
Table Cail Bells.....50 & 10 @ 50%

Belting—

Leather—
Extra Heavy, Short Lap.....60 @ 60 & 5%
Regular Short Lap.....65 & 10 @ 70%
Standard.....70 & 5 @ 70 & 10%
Light Standard.....70 & 10 @ 75%
Cut Leather Lacing.....60 & 10%
Leather Lacing Sides, per sq. ft. 17 1/2 @ 18 1/4

Rubber—

Agricultural (Low Grade).....75 @ 75 & 5%
Common Standard.....70 @ 70 & 10%
Standard.....65 & 70%
Extra.....60 & 5 @ 60 & 10%
High Grade.....50 & 5 @ 50 & 10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Great River Tire Benders and Upsetters.....20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—

Tackle—
Common Wooden.....70 & 10 @ 75 & 5%
Hartz St. Tackle Blocks.....50 & 50 & 5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50 & 10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50 & 10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30 & 10 @ 40 & 10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33 1/2

Bolts—

Carriage, Machine, &c.—
Common Carriage (cut thread):
% x 6 and smaller.....75 & 2 1/2
Larger and longer.....70%
Phila. Eagle \$3.00 list May 24, '99

Bolt Ends, list Feb. 14, '95.

Machine, % x 4 and smaller.....75 & 5%
Machine, larger and longer.....70 & 7 1/2%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch. 3 4 5 6 8
Per doz. \$0.30 .35 .45 .56 .75

Cast Iron Spring Foot, Jap'd.

Inch. 6 8 10
Per doz.....\$1.15 1.40 2.00

Cast Iron Chain, Japanned.

Inch. 6 8 10
Per doz.....\$0.95 1.25 1.55

Cast Iron Shutter, Japanned.

Brass Knobs:
Inch. 6 8 10
Per doz.....\$0.80 .90 1.20

Wrt Barrel Jap'd.

Wrt. Spring.....70 & 10 @ 70 & 10 & 10%
Wrt. Shutter.....50 & 5 @ 50 & 10 & 5%
Wrt. Square Neck.....75 @ 75 & 5%
Wrt. Square Neck, &c. @ 10 @ 60 & 4 @ 10 & 10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....65 & 10 @ 65 & 10 & 10%
Stove.....82 1/2 @ 10 @ 82 1/2 @ 10 & 5%

Tire—

Common.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84.....82%
Eagle Phila., list Oct. 16, '84.....82%
Bay State, list Dec. 28, '99.....81%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. 16, '84.....80%
Upon Nut Co.:
Tire Bolts.....72 1/2%

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch. 1 1/4 1 1/2 1 3/4 2
Per doz. \$4.80 5.60 6.40 8.00
Inch. 2 1/2 3 3 1/2 4 4 1/2
Per doz. \$6.65 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.50; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon.....15 & 10%
Perfection..... \varnothing doz. \$30.00
Schatz.....40%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball American, \$1.25 @ 1.50
Barber's.....50 & 10 @ 60 & 10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 411
C. E. Jennings & Co.....50 & 5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25 & 10%
P. S. & W. Co., Peck's Pat. 60 & 10 @ 60%
Stanley R. & L. Co.:
Stanley.....35%
Victor.....45%

Brackets—

Wrought Steel.....80 & 10 @ 80 & 10 & 5%
Bradley's Wire Shelf:
Full cases.....80 & 10 @ 10%
Broken cases.....80 & 10%
Griffin's Pressed Steel.....80%
Griffin's Folding Brackets.....70 & 10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....60 & 10%
Western, W. G. Co., Wire.....60 & 10%

Bright Wire Goods—

See Wire and Wire Goods.

Boilers—

Western, W. G. Co.....80%
Wire Goods Co.....70 @ 75 & 10%

Buckets, Galvanized—

Price per dozen
Quart.....19 12 14
Water, Regular.....1.40 1.70 1.90
Water, Heavy.....3.40 3.70 3.95
Fire, Rd. Bottom.....2.30 2.55 2.85
Well.....2.55 2.87 3.15

Bucks, Saw—

Hooster..... \varnothing doz. \$36.00

Bull Rings—

See Rings, Bull

Butts—

Brass—
Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40 & 10 @ 50%
Fast Joint, Narrow.....40 & 10 @ 50%
Loose Joint.....70 & 10 @ 75%
Loose Pin.....70 & 10 @ 75%
Mayer's Hinges.....70 @ 70 & 5%
Parliament Butts.....70 @ 70 & 5%

Wrought Steel—

Table and Back Flaps.....75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70 & 10%
Loose Pin, Ball and Steeple.....85%
Tin.....70 & 10%
Japanned Ball Tip Butts.....70 & 10%

Bronzed, Wrt., Nar. and Inside Blind Butts.....55 & 10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....50%
1200 series.....40 & 10%
200, 300, 600 and 900 series.....40 & 10%
Hendryx, Bronze:
700, 800 series.....40 & 10%
Hendryx, Enameled.....40 & 10%

Calipers—See Compasses.**Calks, Toe and Heel—**

Blunt, 1 prong.....	per lb.	1.45	1.45
Sharp, 1 prong.....	per lb.	1.45	1.45
Gautier, Blunt.....	per lb.	1.45	1.45
Gautier, Sharp.....	per lb.	1.45	1.45
Blunt Toe.....	per lb.	1.45	1.45
Perkins, Sharp Toe.....	per lb.	1.45	1.45

Can Openers—

See Openers, Can.

Cans, Milk—

Illinois Pattern.....	1.35	1.55	2.05 each.
New York Pattern.....	1.50	2.20	2.45 each.
Baltimore Pattern.....	1.50	2.20	2.45 each.
Duluth Pattern.....	1.35	1.60	1.75 each.

Cans, Oil—

Bush's Family Oil Cans:			
3 gal.	5	8	10 gal.
5 gal.	10	15	20 gal.
10 gal.	20	30	40 gal.
15 gal.	30	45	60 gal.
20 gal.	40	60	80 gal.
25 gal.	50	75	100 gal.
30 gal.	60	90	120 gal.
35 gal.	70	105	140 gal.
40 gal.	80	120	160 gal.
45 gal.	90	135	180 gal.
50 gal.	100	150	200 gal.
55 gal.	110	165	220 gal.
60 gal.	120	180	240 gal.
65 gal.	130	195	260 gal.
70 gal.	140	210	280 gal.
75 gal.	150	225	300 gal.
80 gal.	160	240	320 gal.
85 gal.	170	255	340 gal.
90 gal.	180	270	360 gal.
95 gal.	190	285	380 gal.
100 gal.	200	300	400 gal.

Caps, Percussion—

Eley's E. B.....	per M	34	35
G. D.....	per M	40	42
F. L.....	per M	45	50
G. E.....	per M	62	63
Musket.....	per M	62	63

Primers—

Berdan Primers, \$2 per M.....	20%
B. L. Caps (Sturtevant Shells).....	20%
\$2 per M.....	20%
All other primers per M.....	\$1.50 to \$1.60

Cartridges—

Blank Cartridges:			
32 C. F., \$5.50.....	10	15	5%
38 C. F., \$7.00.....	10	15	5%
22 cal. Rim, \$1.50.....	10	15	5%
32 cal. Rim, \$2.75.....	10	15	5%
B. B. Caps, Con. Ball, Suedg. \$1.90.....	10	15	5%
B. B. Caps, Round Ball.....	10	15	5%
Central Fire.....	25	30	5%
Target and Sporting Rifle.....	15	20	5%
Primed Shells and Bullets.....	15	20	5%
Rim Fire, Sporting.....	50	60	5%
Rim Fire, Military.....	15	20	5%

Casters—

Bed.....	70	10	10%
Plate.....	60	10	10%
Philadelphia.....	75	10	10%
Ame. Ball Bearing.....	35	10	10%
Boss.....	70	10	10%
Boss Anti-Friction.....	70	10	10%
Boss (Roller Bearing).....	80	10	10%
Martin's Patent (Phoenix).....	45	10	10%
Standard Ball Bearing.....	45	10	10%
Tucker's Patent low list.....	30	10	10%
Yale (Double Wheel) low list.....	50	10	10%

Cattle Leaders—

See Leaders, Cattle.

Chain, Coil—

American Coil, Straight Link:			
3-16 5-16 5-16 3-16 7-16 1/2 9-16			
7-16 5-16 4-15 3-16 3-30 3-20 3-15			
3-16 3-16 3-16 1 to 1 1/4 inch			
3-16 3-16 2-15 2-15 per 100 lb.			
German Coil.....	60	10	10%

Halters and Ties—

Halter Chains.....	60	10	10%
German Pattern Halter Chains.....	60	10	10%
Iron July 24, '97.....	60	10	10%
Cow Ties.....	60	10	10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.			
6-1/2-6-3, 8-1/2, with ring.....	\$23.50		
6-1/2-8-2, 8-1/2, with ring.....	\$24.50		
6-1/2-10-2, 8-1/2, with ring.....	\$32.00		
NOTE—Add 2c per pair for Hooks.			
Twist Traces 2c per pair higher than			
Straight Link.			
Trace, Wagon and Fancy			
Chains.....	60	10	10%

Miscellaneous—

Jack Chain, list July 10, '93:			
Iron.....	60	10	10%
Brass.....	60	10	10%
Safety Chain.....	75	10	10%
Gal. Pump Chain.....	10	10	10%
Covert Mfg. Co.:			
Breast.....	40	2	5%
Halter.....	40	2	5%
Rein.....	40	2	5%
Stallion.....	40	2	5%
Covert Saddle Works:			
Breast.....	70	10	10%
Halter.....	70	10	10%
Hold Back.....	70	10	10%
Rein.....	70	10	10%
Onida Community:			
Am. Coil and Halters.....	40	10	10%
Am. Cow Ties.....	45	10	10%
Eureka Coil and Halter.....	45	10	10%
Niagara Coil and Halter.....	45	10	10%
Niagara Cow Ties.....	45	10	10%
Niagara Wire Dog Chains.....	45	10	10%
Wire Goods Co.:			
Dog Chain.....	70	10	10%
Universal Dbl. Jointed Chain.....	50	10	10%

Chalk—(From Jobbers.)

Carpenters' Blue.....	gro.	35	38
Carpenters' Red.....	gro.	30	33
Carpenters' White.....	gro.	25	28
See also Crayons.			

Checks, Door—

Barisley's.....	45	10	10%
Columbia.....	50	10	10%
Eclipse.....	60	10	10%

Chests, Tool—

American Tool Chest Co.:			
Box's Chests, with Tools.....	55	10	10%
Yonah's Chests, with Tools.....	40	10	10%
Gentlemen's Chests, with Tools.....	30	10	10%
Farmers' Carpenters', etc., Chests,			
with Tools.....	20	10	10%
Machinists' and Pipe Fitters'.....	20	10	10%
Chests, Empty.....	50	10	10%
Tool Cabinets.....	50	10	10%
C. E. Jennings & Co.'s Machinists'.....	35	10	10%

Chisels—**Socket Framing and Firmer**

Standard List.....	70	10	10%
Buck Bros.....	30	10	10%
Charles Buck.....	30	10	10%
C. E. Jennings & Co. Socket Firmer.....	60	10	10%
C. E. Jennings & Co. Socket Framing No. 15.....	60	10	10%
Ohio Tool Co.'s.....	70	10	10%
Swan's.....	70	10	10%
L. & I. J. White.....	50	10	10%

Tanged—

Tanged Firmers.....	40	10	10%
Buck Bros.....	30	10	10%
Charles Buck.....	30	10	10%
C. E. Jennings & Co. Nos. 191, 181.....	25	10	10%
L. & I. J. White, Tanged.....	25	10	10%

Cold—

Cold Chisels, good quality.....	15	10	10%
Cold Chisels, fair quality.....	11	10	10%
Cold Chisels, ordinary.....	9	10	10%

Chucks—

Beach Pat. each \$3.00.....	35	10	10%
Pratt's Positive Drive.....	25	10	10%
Empire.....	25	10	10%
Blacksmiths'.....	25	10	10%
Skinner Patent Chucks:			
Independent Lathe Chucks.....	50	10	10%
Universal.....	50	10	10%
Combination.....	50	10	10%
Drill Chucks, New Model.....	30	10	10%
Drill Chucks, Standard.....	45	10	10%
Drill Chuck, Skinner Pat. 0, 1, 2, 3.....	45	10	10%
Drill Chucks, Skinner Pat. 3, 4, 5, 6, 7, 8.....	35	10	10%
Drill Chucks, Positive Drive.....	30	10	10%
Planer Chucks.....	40	10	10%
Face Plate Jaws.....	40	10	10%
Standard Tool Co.:			
Improved Drill Chuck.....	45	10	10%
Union Mfg. Co.:			
Combination.....	50	10	10%
Czar Drill.....	40	10	10%
Geared Scroll.....	40	10	10%
Independent.....	50	10	10%
Independent Steel.....	40	10	10%
Union Drill.....	45	10	10%
Universal.....	50	10	10%
Independent Iron P. Plate Jaws.....	40	10	10%
Independent Steel P. Plate Jaws.....	40	10	10%

Westcott Patent Chucks:

Lathe Chucks.....	50	10	10%
Little Giant Auxiliary Drill.....	50	10	10%
Little Giant Double Grip Drill.....	50	10	10%
Little Giant Drill, Improved.....	50	10	10%
Onida Drill.....	50	10	10%
Scroll Combination Lathe.....	50	10	10%

Clamps—

Adjustable, Hammers'.....	20	10	10%
Cabinet, Sargent's.....	50	10	10%
Carriage Makers', P. S. & W. Co.....	60	10	10%
Carriage Makers', Sargent's.....	60	10	10%
Besly, Parallel.....	33	10	10%
Lineman's, Utica Drop Forge & Tool Co.....	40	10	10%
Saw Clamps, see Vises, Saw Filers'.			

Cleaners, Drain—

Iwan's Champion, Adjustable.....	55	10	10%
Iwan's Champion, Stationary.....	45	10	10%

Sidewalk—

Star Socket, All Steel.....	40	10	10%
Star Shank, All Steel.....	30	10	10%
W. & C. Shank, All Steel.....	40	10	10%
7 1/2 in., \$3.00; 8 in., \$3.25.			

Cleavers, Butchers'—

Foster Bros.....	30	10	10%
New Haven Edge Tool Co.'s.....	45	10	10%
Payette R. Plumb.....	33	10	10%
L. & I. J. White.....	30	10	10%

Clippers—

Chicago Flexible Shaft Company:			
'98 Chicago Horse.....	38	10	10%
1902 Chicago Horse.....	40	10	10%
20th Century Horse, each.....	50	10	10%
Lightning Belt.....	15	10	10%
Chicago Belt.....	20	10	10%
Stewart's Patent Sheep.....	12	10	10%

Finger Nail Clippers—

Smith & Hemenway Co. per doz. net \$2.00			
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Clips, Axle—

Eagle, 5-16 and 3/4 in.....	75	10	10%
Norway, 5-16 and 3/4 in.....	60	10	10%

Cloth and Netting, Wire

—See Wire, &c.

Cocks, Brass—

Hardware List:			
Compression, Plain Btbs.....			
Globe, Kerosene, Racking, &c., Cocks.....	70	10	10%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....	40	10	10%
Leather, Walter B. Stevens & Son's list.....	40	10	10%

Combs, Curry—

Metal Stamping Co.....	40	10	10%
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Mane and Tail—

Covert's Saddlery Works.....	60	10	10%
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Compasses, Dividers, &c.

Ordinary Goods.....	75	10	10%
Bemis & Call Hdw. & Tool Co.:			
Dividers.....	65	10	10%
Calipers, Double.....	65	10	10%
Calipers, Inside or Outside.....	65	10	10%
Calipers, Wing.....	60	10	10%
Compasses.....	50	10	10%

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory. Nested, Not nested.			
A. Eastern.....	75	10	10%
B. Eastern.....	75	10	10%
Central.....	70	10	10%
Southern.....	70	10	10%
S. Western.....	70	10	10%
Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.			
See also Eave Troughs.			

Coolers, Water—

Gal. each.....	2	3	4	6	8
Labrador.....	\$1.20	\$1.50	\$1.80	\$2.10	\$2.70
Gal.....	3	4	6	8	
Iceland, ea.....	\$1.80	\$2.10	\$2.40	\$3.00	
Gal.....	2	3	4	6	8
Galv. Lined, ea.....	\$1.55	\$2.00	\$2.25	\$2.90	\$3.90
Galv. Lined, side handles.....	25				
Gal.....	2	3	4	6	8
Each.....	\$1.95	\$2.15	\$2.40	\$3.30	\$4.15..25%

Coopers' Tools—

See Tools, Coopers'.

Cord— Sash—

Braided, Drab.....	lb.	35	4
Braided White, Com. lb.....	21	22	1/2
Cable Laid Italian.....			
lb., A, 18¢; B, 16¢			
Common India.....	lb.	10	10 1/2
Cotton Sash Cord, Twisted.....	11	10	17
Patent Russia.....	lb.	11	15
Cable Laid Russia.....	lb.	11	15
India Hemp, Braided.....	lb.	11	18
India Hemp, Twisted.....	lb.	12	13 1/2
Patent India, Twisted.....	lb.	12	13 1/2
Amnition Cordage Co.: Braided Cotton			
Glorious, Nos. 7 to 12.....	lb.	28	8
Amnition, Nos. 7 to 12.....	lb.	28	8
Old Colony, Nos. 7 to 12.....	lb.	22	8
Amnition Drab, Nos. 7 to 12.....	lb.	26	8
Pearl Braided, cotton, No. 6.....	lb.	24	8
22½¢; No. 7, 21½¢; Nos. 8, 9 and			
10, 20.....			
Glystone Braided, Nos. 7, 8 and 9.....	lb.	24	8
Glydstone Braided Cotton, No. 6.....	lb.	25	8
Amnition Cable Laid Italian, Nos. 7			
to 10.....	lb.	23	7
Cable Laid Italian.....			
A quality, Drab.....	lb.	16	4
Cable Laid Russian.....	lb.	14	4
Cable Laid India.....	lb.	12	4
Braided India.....	lb.	18	4
Amnition, Nos. 10 to 12.....	lb.	40	4
Braided, Drab Cotton.....	lb.	40	4
Braided, Italian Hemp.....	lb.	40	4
Braided, Linen.....	lb.	55	4
Braided, White Cotton or Spot.....	lb.	35	4
Massachusetts, White.....	lb.	28	4
Massachusetts, Drab.....	lb.	28	4
Phoenix, White, Nos. 12, 24; No.			
7, 21½¢; No. 6, 25½¢.			
Silver Lake:			
A quality, Drab.....	lb.	40	4
A quality, White.....	lb.	35	4
B quality, White.....	lb.	35	4
B quality, White.....	lb.	35	4
Italian Hemp.....	lb.	40	4
Linen.....	lb.	57	1/2

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ @ 33 $\frac{1}{2}$ & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$ per cent. discount to 33 $\frac{1}{2}$ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 $\frac{1}{2}$ %
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb 7 $\frac{1}{2}$ @7 $\frac{1}{2}$ %
Hay-Budden, Wrought..... $\frac{1}{2}$ lb 9 $\frac{1}{2}$ @
Horseshoe brand, Wrought..... $\frac{1}{2}$ lb 9 $\frac{1}{2}$ @
Trenton..... $\frac{1}{2}$ lb 9 $\frac{1}{2}$ @

Imported—

Peter Wright & Sons..... $\frac{1}{2}$ lb 10 $\frac{1}{2}$ %
Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15&10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Hull Bros. Co.....30&10%
Livingston Nail Co.....33 $\frac{1}{2}$ %

Augers and Bits—

Com. Double Spur.....70&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Jennings' Pattern.....70&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25%
No. 30, R. Jennings' list.....40&7 $\frac{1}{2}$ %
Russell Jennings.....25&10&2 $\frac{1}{2}$ %
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....15%
Millers Falls.....50&25&7 $\frac{1}{2}$ %
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....50&10%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60&10%
Wright's Jennings' Bits (R. Jennings' list).....50%
Bit Stock Drills—
See Drills, Twist.

Expansive Bits—

Clark's small, \$18; large, \$35.....50&10%
Clark's Pattern No. 1, $\frac{1}{2}$ doz. \$25.....50&10%
No. 2, \$18.....50&10%
Ford's, Clark's Pattern.....50&10&60%
C. E. Jennings & Co., Steer's Pat.....25%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut..... $\frac{1}{2}$ doz. \$3.25
German Pattern, Nos. 1 to 10.....\$4.60; 11 to 15, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$9.00 to \$10.00
Ames.....25&10%
New Patent.....25&10%
Universal.....25%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15%
Watrous.....35&5%
Ohio Tool Co.'s.....40%
Snell's.....40%

Awl Hafts—See Hafts, Awl.

Awls—

Brad Awl:
Handled.....gro. \$2.75@3.00
Unhanded, Shlided.....gro. \$3.63@6.64
Unhanded, Patent.....gro. \$6.66@7.04
Peg Awls:
Unhanded, Patent.....gro. \$1.31@1.44
Unhanded, Shlided.....gro. \$5.65@6.70
Scratch Awls:
Handled, Com.....gro. \$3.50@4.00
Handled, Socket.....gro. \$11.50@12.00
Hurwood.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights. (up to 3 $\frac{1}{2}$ lb.)
First Quality.....\$6.50
Second Quality.....\$6.00

NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar.....4 $\frac{1}{2}$ @4 $\frac{1}{2}$ %
Concord, Solid Collar.....5 $\frac{1}{2}$ @5 $\frac{1}{2}$ %
No. 1 Common, Loose.....3 $\frac{1}{2}$ @3 $\frac{1}{2}$ %
No. 1 $\frac{1}{2}$ Com., New Styles.....4 $\frac{1}{2}$ @
No. 2 Solid Collar.....4 $\frac{1}{2}$ @
Nos. 7, 8, 11 and 12.....75@75 $\frac{1}{2}$ %
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18.....75&10@75&10&5%
Nos. 19 to 22.....75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned.....lb. 4 $\frac{1}{2}$ @5 $\frac{1}{2}$ %
Common and Concord, turned.....lb. 5 $\frac{1}{2}$ @6 $\frac{1}{2}$ %
Half Patent.....lb. 8 $\frac{1}{2}$ @9 $\frac{1}{2}$ %

Bait— Fishing—

Hendryx.....20%
A Bait.....25%
B Bait.....25%
Competitor Bait.....20&5%

Balances—

Caldwell new list.....50%
Pullman.....50&10@60%

Spring—

Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%
Barb Wire—See Wire, Barb.

Bars— Crow—

Steel Crowbars, 10 to 40 lb.....per lb, 2 $\frac{1}{2}$ @3 $\frac{1}{2}$ %

Towel—

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$ gro. \$3.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.85;
Tinned.....\$1.00
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.10;
Tinned.....\$1.20
No. 10 Wire Galvanized.....\$1.75

Western W. G. Co.:—

No. 1 Electric..... $\frac{1}{2}$ gro. \$7.00
No. 2 Buffalo..... $\frac{1}{2}$ gro. \$7.50
No. 3 Perfection Dust..... $\frac{1}{2}$ gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned..... $\frac{1}{2}$ doz. \$1.20
Holt, No. 1, Tinned..... $\frac{1}{2}$ doz. \$1.50
Holt, No. B, Japanned..... $\frac{1}{2}$ doz. \$2.50
Holt, No. 2, Tinned..... $\frac{1}{2}$ doz. \$2.25
Lyon, No. 2, Japanned..... $\frac{1}{2}$ doz. \$1.25
Lyon, No. 3, Japanned..... $\frac{1}{2}$ doz. \$1.50
Taplin Mfg. Co.:
No. 60 Improved Dover.....\$4.00
No. 75 Improved Dover.....\$6.50
No. 100 Improved Dover.....\$8.50
No. 102 Improved Dover, Tin'd.....\$8.50
No. 150 Improved Dover, Hotel.....\$15.00
No. 152 Imp'd Dover, Hotel, T'd.....\$17.00
No. 200 Imp'd Dover Tumbler.....\$3.50
No. 202 Imp'd Dover Tumbler, T'd.....\$9.50
No. 300 Imp'd Dover Mammoth, $\frac{1}{2}$ doz.....\$25.00
Western W. G. Co., Buffalo.....\$7.00
Wonder (S. S. & Co.), $\frac{1}{2}$ gro. net, \$6.00

Bells—

Blacksmith, Standard List.....60&10@70&10%

Blacksmiths'—

Inch. 30 32 34 36 38 40
Each \$3.25 3.50 4.00 4.50 5.00 5.75
Extra Length:
Each \$3.75 4.25 4.75 5.25 6.00 7.00

Hand—

Inch. 6 7 8 9 10
Doz. \$4.50 5.00 5.50 6.00 6.50

Molders—

Inch. 9 10 11 12 14
Doz. \$8.00 9.00 10.50 12.50 14.50

Bells— Cow—

Ordinary goods.....75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey.....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home R. & E. Mfg. Co.'s.....55&10%
Lever & Pull, Sargent.....80&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....60&5@60&10&5%

White Metal.....60%
Nickel Plated.....50&10@50&10&5%
Swiss.....60&10@60&7 $\frac{1}{2}$ %
Cone's Globe Hand Bells.....33 $\frac{1}{2}$ @35%
Silver Chime.....33 $\frac{1}{2}$ @35%

Miscellaneous—

Farm Bells.....lb. 2 $\frac{1}{2}$ @
Steel Alloy Church and School.....50&10&5@60&5%
American Tube & Stamping Co.....75%
Table Call Bells.....50&50&10%

Belting— Leather—

Extra Heavy, Short Lap.....60@60&5%
Regular Short Lap.....65&10@70%
Standard.....70&5@70&10%
Light Standard.....70&10@75%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft. 17 $\frac{1}{2}$ @18 $\frac{1}{2}$ %

Rubber—

Agricultural (Low Grade).....75@75&5%
Common Standard.....70@70&10%
Standard.....65&70%
Extra.....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters.....20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Bicycle Goods—

John S. Leung's Son's 1902 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks— Tackle—

Common Wooden.....70&10@75&5%
Hartz St. Tackle Blocks.....50&50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30&19@40&10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....88 $\frac{1}{2}$ %

Boils—

Carriage, Machine, &c.—

Common Carriage (cut thread):
 $\frac{1}{2}$ & 6 and smaller.....75&2 $\frac{1}{2}$ %
Larger and longer.....70%
Phila. Eagle \$3.00 list May 24, '99

Bolt Ends, list Feb. 14, '95, 70&5%
Machine, $\frac{1}{2}$ & 4 and smaller.....75&5%
Machine, larger and longer.....70&7 $\frac{1}{2}$ %

Door and Shutter—

Cast Iron Barrel, Japanned,
Round Brass Knob:
Inch. 3 4 5 6 8
Per doz. \$0.30 .35 .45 .56 .75

Cast Iron Spring Foot, Jap'd:
Inch. 6 8 10
Per doz. \$1.15 1.50 2.00

Cast Iron Chain, Flat, Japanned:
Inch. 6 8 10
Per doz. \$0.95 1.25 1.53

Cast Iron Shutter, Japanned,
Brass Knobs:
Inch. 6 8 10
Per doz. \$0.80 .90 1.20

Wrt. Spring.....80&10@80&10%
Wrt. Shutter.....50&5@50&10%
Wrt. Square Neck.....75@75&10%
Wrt. Square.....65&10@65&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....65&10@65&10&10%
Stove.....82 $\frac{1}{2}$ @82 $\frac{1}{2}$ @82 $\frac{1}{2}$ @10&5%

Tire—

Common.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82 $\frac{1}{2}$ %
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82 $\frac{1}{2}$ %
Eclipse, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. 16, '84.....80%
Upon Nut Co.:
Tire Bolts.....72 $\frac{1}{2}$ %

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch. 1 1 $\frac{1}{2}$ 2
Per doz. \$4.80 5.60 6.40 8.00
Inch. 2 $\frac{1}{2}$ 3 4 5
Per doz. \$5.65 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon.....15&10%
Perfection..... $\frac{1}{2}$ doz. \$30.00
Schatz.....40%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball American, \$1.25 (1.30)
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.:
Mayhew's Ratchet.....50&5%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25&10%
P. S. & W. Co., Pock's Pat.....60&10&60%
Stanley R. & L. Co.:
Stanley.....35%
Victor.....45%

Brackets—

Wrought Steel.....80&10@80&10&5%
Bradley's Wire Shelf:
Full cases.....80&10&10%
Broken cases.....80&10%
Griffin's Pressed Steel.....80%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....35%
Stowell's Sink.....30%
Western W. G. Co., Wire.....60&10%

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Western W. G. Co.....80%
Wire Goods Co.....70&75&10%

Buckets, Galvanized—

Price per dozen,
Quart.....19 12 14
Water, Regular.....1.40 1.70 1.90
Water, Heavy.....3.40 3.70 3.80
Fire, Rd. Bottom.....2.30 2.55 2.95
Well.....2.55 2.87 3.15

Bucks, Saw—

Hoosier..... $\frac{1}{2}$ gro. \$36.00

Bull Rings—See Rings, Bull

Butts— Brass—

Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow.....40&10@50%
Loose Joint.....70&10@70%
Loose Pin.....70&10@70%
Mayer's Hinges.....70&10@70%
Parliament Butts.....70&10@70%

Wrought Steel—

Table and Back Flaps.....75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple
Tin.....85%
Japanned Ball Tip Butts.....70&10%
Bronzed, Wrt., Nar. and In-
side Blind Butts.....55&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....35%
1200 series.....35%
200, 300, 600 and 900 series.....40&10%
Hendryx, Bronze:
700 series.....40&10%
Hendryx, Enameled.....40&10%

Calipers—See Compasses.

Calks, Toe and Heel—
Blunt, 1 prong... per lb. \$1.45
Blunt, 1 prong... per lb. \$1.45
Blunt, 1 prong... per lb. \$1.45
Blunt, 1 prong... per lb. \$1.45
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Blunt, 1 prong... per lb. \$1.45
Blunt, 1 prong... per lb. \$1.45
Blunt, 1 prong... per lb. \$1.45

Can Openers—

See Openers, Can.

Cans, Milk—

5 8 10 gal.
Illinois Pattern... \$1.35 1.85 2.05 each.
New York Pattern... 1.50 2.20 2.45 each.
Baltimore Pattern... 1.50 2.20 2.45 each.
Duluth... 1.35 1.60 1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:
3 5 10 gal.
\$18.00 60.00 125.00 gro., net.

Caps, Percussion—

Eley's E. B. ... \$2.55
G. D. ... per M \$3.45
F. L. ... per M \$4.50
G. E. ... per M \$4.50
Musket ... per M \$6.65

Primers—

Berdan Primers, \$2 per M... 20%
B. L. Caps (Sturtevant Shells)
\$2 per M... 20%
All other primers per M \$1.58 @ 1.60

Cartridges—

Blank Cartridges:
32 C. P. \$5.50... 10.65%
38 C. P. \$7.00... 10.65%
22 cal. Rim, \$1.50... 10.65%
32 cal. Rim, \$2.75... 10.65%
B. B. Caps, Con. Ball, Stegd. \$1.90
B. B. Caps, Round Ball... \$1.49
Target Fire... 25%
Fur and Sporting Rifle... 15.65%
Primed Shells and Bullets... 15.10%
Rim Fire, Sporting... 50%
Rim Fire, Military... 15.65%

Castors—

Bed ... 70 @ 70 & 10%
Plate ... 60 @ 10 & 60 & 10.65%
Philadelphia ... 75 @ 75 & 10%
Acme Ball Bearings... 70 @ 10%
Bess Anti-Friction... 70 @ 10%
Gem (Roller Bearing)... 80
Martin's Patent (Phoenix)... 45
Standard Ball Bearing... 45
Tucker's Patent low list... 50
Yale (Double Wheel) low list... 50

Cattle Leaders—

See Leaders, Cattle.

Chain, Coil—

American Coil, Straight Link:
3-16 1/4 5-16 3/4 7-16 1/2 9-16 3/4
7-16 5-10 4-16 3-16 3-32 3-16 3-16
3/4 3/4 1 to 1 1/4 inch
3-10 3-00 2-95 2-95 per 100 lb.
German Coil... 60 @ 10 & 60 @ 10.70%

Halters and Ties—

Halter Chains... 60 @ 10 & 60 @ 10.10%
German Pattern Halter Chains,
list July 24, '97... 60 @ 10 & 10%
Cow Ties... 60 @ 10 & 10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6-5-3, Str'ght, with ring, \$23.50
6-5-2, Str'ght, with ring, \$24.50
6-5-2, Str'ght, with ring, \$28.00
NOTE—Add 2c per pair for Hooks.
Tied Traces 2c per pair higher than
Straight Link.

Trace, Wagon and Fancy

Chains... 60 @ 10 & 60 @ 10.65%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron... 60 @ 10 & 60 @ 10.65%
Brass... 60 @ 10 & 60 @ 10.10%
Safety Chain... 75 @ 75 & 10.65%
Gal. Pump Chain... 10 @ 5.45%
Covert Mfg. Co.:
Brest... 40 @ 2%
Halter... 40 @ 2%
Rein... 40 @ 2%
Stallion... 40 @ 2%
Covert Sad. Works:
Halter... 70%
Hold Back... 70%
Rein... 70%
Oneda Community:
Am. Coil and Halters... 40 @ 10.65%
Am. Cow Ties... 45 @ 50.65%
Eureka Coil and Halter... 45 @ 50.65%
Niagara Coil and Halter... 45 @ 50.65%
Niagara Cow Ties... 45 @ 50.65%
Niagara Wire Dog Chains... 45 @ 50.65%
Wig Goods Co.:
Dog Chain... 70 @ 10%
Universal Dbl.-Jointed Chain... 50%

Chalk—(From Jobbers.)

Carpenters' Blue... gro. 35 @ 38¢
Carpenters' Red... gro. 30 @ 33¢
Carpenters' White... gro. 25 @ 28¢
See also Crayons.

Checks, Door—

Bardsley's... 45%
Columbia... 50 @ 10%
Elipse... 60 @ 10%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools... 55%
Youths' Chests, with Tools... 40%
Gentlemen's Chests, with Tools... 30%
Farmers' Carpenters', etc., Chests,
with Tools... 20%
Machinists' and Pipe Fitters'
Chests, Empty... 50%
Tool Cabinets... 50%
C. E. Jennings & Co.'s Machinists'
Tool Chests... 33 @ 10%

Chisels—**Socket Framing and Firmer**

Standard List... 70 @ 10 & 75 @ 10%
Buck Bros... 30%
Charles Buck... 30%
C. E. Jennings & Co. Socket Firmer
No. 10... 60%
C. E. Jennings & Co. Socket Firmer
ing No. 15... 60%
Ohio Tool Co.'s... 70%
Swan's... 70%
L. & I. J. White... 30 @ 30 & 5%

Tanged—

Tanged Firmers... 10 @ 10 & 10%
Buck Bros... 30%
Charles Buck... 30%
C. E. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White, Tanged... 25 @ 5%

Cold—

Cold Chisels, good quality... 13 @ 15¢
Cold Chisels, fair quality... 11 @ 12¢
Cold Chisels, ordinary... 9 @ 10¢

Chucks—

Beach Pat., each \$8.00... 35 @ 5%
Patent's Positive Drive... 25%
Empire... 25%
Blacksmiths'... 25%
Skinner Patent Chucks:
Independent Lathe Chucks... 50%
Universal... 50%
Combination... 50%
Drill Chucks, New Model... 30%
Drill Chucks, Standard... 45%
Drill Chuck, Skinner Pat., 0, 1, 2, 35%
Drill Chucks, Skinner Pat., 3, 4, 35%
5, 6, 7, 8... 35%
Drill Chucks, Positive Drive... 30%
Plane Chucks... 25%
Face Plate Jaws... 40%
Standard Tool Co.:
Improved Drill Chuck... 45%
Union Mfg. Co.:
Combination... 50%
Czar Drill... 35%
Combination Geared Scroll... 40%
Geared Scroll... 40%
Independent... 50%
Independent Steel... 40%
Union Drill... 45%
Universal... 40%
Independent Iron P. Plate Jaws... 40%
Independent Steel P. Plate Jaws... 40%
Westcott Patent Chucks:
Lathe Chucks... 50%
Little Giant Auxiliary Drill... 50%
Little Giant Double Grip Drill... 50%
Little Giant Drill, Improved... 50%
Oneda Drill... 50%
Scroll Combination Lathe... 50%

Clamps—

Adjustable, Hammers... 20 @ 20 & 5%
Cabinet, Sargent's... 50 @ 10%
Carriage Makers', P. S. & W. Co. 50%
Carriage Makers', Sargent's... 60%
Besly, Parallel... 33 @ 10%
Lineman's, Utica Drop Forge & Tool
Co... 40%
Saw Clamps, see Vises, Saw Filers.

Cleaners, Drain—

Iwan's Champion, Adjustable... 55%
Iwan's Champion, Stationary... 45%

Sidewalk—

Star Socket, All Steel... \$9 doz. \$4.05 net
Star Shank, All Steel... \$9 doz. \$3.24 net
W. & C. Shank, All Steel... \$9 doz.,
7 1/2 in., \$3.00; 8 in., \$3.25.

Cleavers, Butchers—

Poster Bros... 30%
New Haven Edge Tool Co.'s... 45%
Fayette R. Plumb... 33 @ 35 & 10%
L. & I. J. White... 30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse... \$8.75 15%
1902 Chicago Horse... 10.75 15%
20th Century Horse, each... 55.00 20%
Lightning Belt... 15.00 15%
Chicago Belt... 20.00 15%
Stewart's Patent Sheep... 12.75 20%
L. & I. J. White... 30%

Finger Nail Clippers—

Smith & Hemenway Co. \$9 doz. net \$2.00

Clips, Axle—

Eagle, 5-16 and 3/4 in. 75 @ 75 & 10%
Norway, 5-16 and 3/4 in. 60 @ 10 & 70%

Cloth and Netting, Wire

See Wire, &c.

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs,
Globe, Kerosene, Racking,
&c., Cocks... 70 @ 10 & 75%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list... 40%
Leather, Walter B. Stevens & Son's
list... 40%

Combs, Curry—

Metal Stamping Co... 40%

Mane and Tail—

Covert's Saddlery Works... 60 @ 10%

Compasses, Dividers, &c.

Ordinary Goods... 75 @ 5 @ 75 & 10%
Remis & Call Hdw. & Tool Co.:
Dividers... 65%
Calipers, Double... 65%
Calipers, Inside or Outside... 65%
Calipers, Winge... 60%
Compasses... 50%

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory. Nested. Not nested.
A. Eastern... 75 @ 5%
B. Eastern... 75 @ 5%
Central... 75 @ 5%
Southern... 70 @ 2 1/2%
S. Western... 70 @ 5%
Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

Gal. each... 2 3 4 6 8
Labrador... \$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Iceland... \$1.80 \$2.10 \$2.40 \$2.70
Gal... 2 3 4 6 8
Galv. Lined, ea. \$1.35 \$2.00 \$2.25 \$2.50 \$3.90

Gayl. Lined, side handles... 25%
Each... \$1.35 \$2.15 \$2.40 \$3.30 \$4.15 25%

Coopers' Tools—

See Tools, Coopers'.

Cord— Sash—

Braded, Drab... lb. 35¢
Braded White, Com. lb. 21 @ 22 1/2%

Cable Laid Italian—

lb., A, 18¢; B, 16¢
Common India... lb. 10 @ 10 1/2%

Cotton Sash Cord, Twisted... 11 @ 17¢
Patent Russia... lb. 6 @ 14¢

Cable Laid Russia... lb. 6 @ 15¢
India Hemp, Braided... lb. 6 @ 18¢

India Hemp, Twisted... lb. 12 @ 13¢
Patent India, Twisted... lb. 12 @ 13¢

Anniston Cordage Co.: Braided Cotton,
Old Glory, Nos. 7 to 12... \$9 28¢
Anniston, Nos. 7 to 12... \$9 22¢

Old Colony, Nos. 7 to 12... \$9 22¢
Anniston Drab, Nos. 7 to 12... \$9 26¢

Pearl Braided, cotton, No. 6... \$9 10¢
Edgelye, No. 7, 2 1/2¢; Nos. 8 to 12, 21¢

Edgelye Braided, Nos. 7, 8, 9 and 10... \$9 24¢
Edgelye Braided Cotton... \$9 25¢

Harmony Cable Laid Italian, Nos. 7
to 10... \$9 23¢

Peelless:
Cable Laid Italian... 16¢
Cable Laid Russian... 12¢

Cable Laid India... 12¢
Braided India... 18¢

Samson, Nos. 8 to 12:
Braided, Drab Cotton... \$9 40¢
Braided, Italian Hemp... \$9 40¢

Braided, Linen... \$9 55¢
Braided, White Cotton or Spot... \$9 35¢

Massachusetts, White... \$9 28¢
Massachusetts, Drab... \$9 32¢

Phoenix, White, Nos. 8 to 12, 24¢;
Nos. 7, 2 1/2¢; No. 6, 2 1/2¢.

Silver Lake:
A quality, Drab... 40¢
A quality, White... 35¢

B quality, Drab... 35¢
B quality, White... 30¢

India Hemp... 40¢
Linen... 37 1/2¢

Wire, Picture—

List Oct., '00:
85 @ 10 & 10 @ 85 & 10 @ 10.65%
Hendry Standard Wire Picture Cord,
85 @ 10 & 5%

Cradles—

Grain... 40 @ 12 1/2%

Crayons—

White Round Crayons, gr. 5 1/4 @ 6¢
Cases, 100 gro., \$1.00, at factory.

D. M. Steward Mfg. Co.:
Jumbo Crayons... gr. 3.50
Metal Workers' Crayons, gr. 3.50

Soapstone Pencils, round, flat
or square... gr. \$1.50
Raining Mill Crayons... gr. \$2.50

Railroad Crayons (composition)
gr. \$2.00 Case lots, 200

Zelnicker's Lumber:
Red, Blue, Green... gr. \$6.50
Elac... gr. \$4.00

See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy... \$9 doz. \$7.00
Fort Madison, Light... \$9 doz. \$6.50

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1817... \$9 doz. \$3.50

Star, Eagle, Rogers & Hamilton
and Anchor... \$9 doz. \$3.00

Wm. Rogers & Son... \$9 doz. \$2.50

Cutters—Glass—

H. H. Mayhew Co... 40%
Red Devil... 50%
Smith & Hemenway Co... 50%
Woodward... 40%

Meat and Food—

American... 30%
Nos... 1 2 3 4 B 5
Each... \$5 \$7 \$10 \$25 \$50 \$60

Enterprise... 25 @ 25 & 7 1/2%
Nos... 5 10 12 22 32

Each... \$2 \$3 \$2.75 \$4.50 \$6
Dixon's... 2 \$9 doz. 30 @ 10 @ 40%

Nos... 1 2 3 4
\$14.00 \$17.00 \$19.00 \$30.00

Ideal... 40 @ 10 @ 50%
Little Giant... \$9 doz. 33 @ 40%

Nos... 305 310 312 320 322
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00

N. E. Food Choppers... 40%
New Triumph No. 605... \$9 doz. \$24.00

Ruswin Food, No. 1, \$24.00; No. 2,
\$27.00; No. 3, \$30.00; No. 4, \$33.00

Woodruff's... \$9 doz. 30 @ 10 @ 40%
Nos... 100 150

Enterprise Beef Shavers... \$15.00 \$16.00

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c... 40%
Kraut Cutters, 24 x 7, 28 x 8, 30
x 8... 35%

Kraut Cutters, 36 x 12, 40 x 12... 40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife... \$9 doz. \$3.00

Combined Slaw Cutter and Corn
Grater... \$9 doz. \$4.00

Tucker & Dorsey Mfg. Co.:
Kraut Cutters... 40%
Slaw Cutters, 1 Knife... \$9 gr. \$18 @ \$20

Slaw Cutters, 2 Knife... \$9 gr. \$22 @ \$36

Tobacco—

All Iron, Cheap... doz. \$1.25 @ \$1.50

Enterprise... 25 @ 30%
National, \$9 doz, No. 1, \$21; No. 2,
\$18

Sargent's, \$9 doz, No. 12 and 21... 60 @ 10%

Sargent's, Nos. 12 and 21... 60 @ 10%

Washer—

Appleton's, \$9 doz., \$16.00... 50 @ 10 & 10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger, per doz. \$9.00
Iwan's Imp'ved Post Hole Auger... 40 @ 10%

Iwan's Vaughan Pattern Post Hole
Augers... \$9 doz. \$6.25

Iwan's Perfection Post Hole Digger...
\$9 doz. \$8.25

Iwan's Split Handle Post Hole Dig-
gers... \$9 doz. \$7.25

Kohler's Universal... \$9 doz. \$15.00
Kohler's Little Giant... \$9 doz. \$12.00

Kohler's Hercules... \$9 doz. \$9.00
Kohler's Invincible... \$9 doz. \$9.00

Kohler's Rival... \$9 doz. \$8.00
Kohler's Pioneer... \$9 doz. \$7.20

Never-Break Post Hole Diggers...
\$9 doz. \$24.00

Samson, \$9 doz. \$31.00... 25%

Dividers—See Compasses.**Doors, Screen—**

Phillips', style E, 3/4 in... \$9 doz. \$10.00
Phillips', style 077, 3/4 in... \$9 doz. \$7.50

Phillips', style x-3, 3/4 in... \$9 doz. \$10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, \$9
doz., \$18; No. 2, \$15; No. 3, \$12;
No. 4, \$18.

Drawing Knives—

See Knives, Drawing.

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers... 35%
Diamond Wheel Dresser Cutters... 35%

Drills and Drill Stocks—

Common Blacksmiths' Drill,
each... \$1.50 @ \$1.75

Breast, Millers Falls... 15 @ 10%
Breast, P. S. & W... 40 @ 5%

Goodell Automatic Drills, 40 @ 50 @ 10%
Johnson's Automatic Drills, Nos. 2

Faucets—

Cork Lined.....	50¢@50¢10%
Metallic Key, Leather Lined.....	60¢10¢10%
Red Cedar.....	40¢10¢10%
Petroleum.....	70¢10¢10%
B. & L. B. Co.:	
Metal Key.....	60¢10%
Star.....	60%
West Lock.....	50¢10%
John Sommer's Peerless Tin Key.....	50%
John Sommer's Bow Tin Key.....	50%
John Sommer's Victor Mtl. Key.....	50¢10%
John Sommer's Duplex Metal Key.....	60%
John Sommer's Diamond Lock.....	40%
John Sommer's I. X. L. Cork Lined.....	50%
John Sommer's Reliable Cork Lined.....	50¢10%
John Sommer's Chicago Cork Lined.....	60%
John Sommer's O. K. Cork Lined.....	50%
John Sommer's No Brand, Cedar.....	50%
John Sommer's Perfection, Cedar.....	40%
McKenna, Brass:	
Burglar Proof, N. P.....	25%
Improved, 3/4 and 1/2 inch.....	25%
Self Measuring:	
Enterprise, 3/4 doz. \$36.00.....	40¢10%
Lane's, 3/4 doz. \$36.00.....	40¢10%
National Measuring, 3/4 doz. \$36.00.....	40¢10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List revised Nov. 1, 1899.	
Best Brands.....	70¢10¢10%
Standard Brands.....	75¢10¢10%
Lower Grade.....	75¢10¢10%

Imported—

Stubs' Tapers, Stubs' List, July 24, '97.....	33 1-3@40%
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Fixtures, Fire Door—

Richards Mfg. Co.:	
Universal, No. 103.....	\$4.00
Special, No. 104.....	\$4.00
Furniture Lock.....	\$0.25
Expansion Bolts.....	50¢10%

Grindstone—

Net Prices:	
Inch.....	15 17 19 21 24
Per doz.....	\$2.15 2.75 3.25 3.75 4.50
P. S. & W. Co.....	30¢10¢40%
Reading Hardware Co.....	60%
Sargent's.....	70%
Stowell's Giant Grindstone Hanger.....	30%
Stowell's Grindstone Fixtures, Extra Heavy.....	50¢10¢10%
Stowell's Grindstone Fixtures, Light.....	60¢10%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1903, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....	60¢10%
Victor, Hay.....	60¢15¢24%
Victor, Manure.....	66¢
Victor, Header.....	65¢
Champion, Hay.....	66¢
Champion, Header.....	66¢
Champion, Manure.....	60¢15¢24%
Columbia, Hay.....	60¢20%
Columbia, Manure.....	70%
Columbia, Spading.....	70¢12%
Hawkeye Wood Barley.....	40%
W. & C. Potato Digger.....	60¢10%
Acme Hay.....	60¢20%
Acme Manure, 4 time.....	60¢10¢5%
Dakota Header.....	60¢20%
Jackson Steel Barley.....	60¢20%
Kansas Header.....	65%
W. & C. Favorite Wood Barley.....	40%
Plated.—See Spoons.	

Frames— Saw—

White, S'g't Bar, per doz.....	75¢@80¢
Red, S'g't Bar, per doz.....	\$1.00¢1.25
Red, Dbl. Brace, per doz.....	\$1.40¢1.50

Freezers, Ice Cream—

Qt.	1 2 3 4 5
Each	\$1.25 \$1.60 \$1.90 \$2.20 \$2.50

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse—**

Hemp.....	Per 1000 Feet.....	\$2.75
Cotton.....		3.20
Waterproof Sgl. Taped.....		3.65
Waterproof Dbl. Taped.....		4.40
Waterproof Tpl. Taped.....		5.15

Gates, Molasses and Oil—

Stebbins' Pattern.....	80¢10¢10%
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Gauges—

Marking, Mortise, 40.....	50¢10¢5%
Chapin-Stephens Co.:	
Marking, Mortise, 40.....	50¢10¢5%
Scholl's Patent.....	50¢10¢5%
Door Hangers.....	50¢10¢5%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....	35%
Marking and Mortise.....	35%
Wire, Brown & Sharpe's.....	25%
Wire, Morse's.....	25%
Wire, P. S. & W. Co.....	30¢10%

Gimlets— Single Cut—

Numbered assortments, per gro.	
Nail, Metal, No. 1.....	\$2.00; 2, \$2.30
Spike, Metal, No. 1.....	\$4.00; 2, \$4.30
Nail, Wood Handled, No. 1.....	\$2.30; 2, \$2.60
Spike, Wood Handled, No. 1.....	\$4.30; 2, \$4.60

Glass, American Window—

See Trade Report.

Glasses, Level—

Chapin-Stephens Co.....	60¢@60¢10¢10%
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Glue, Liquid Fish—

Bottles or Cans, with Brush.....	25¢@50%
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Cans (1/2 pts., pts., qts., 1/2 gal., gal.).....	25¢@48%
International Glue Co. (Martin's).....	40¢10%

Grease, Axle—

Common Grade.....	gro. \$4.50¢5.50
Dixon's Everlasting.....	10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes.....	1 lb, \$1.20; 2 lb, \$2.00

Grips, Nipple—

Perfect Nipple Grips.....	40¢10¢2%
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Griddles, Soapstone—

Pike Mfg. Co.....	33%@33%10%
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Grindstones—

Bicycle Emery Grinder.....	\$6.50
Bicycle Grindstones, each.....	\$2.50¢3.00
Pike Mfg. Co.:	
Improved Family Grindstones, per inch, 3/4 doz.....	\$2.00
Pike Mower and Tool Grinder, each.....	\$6.00
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....	\$3.25

Halters and Ties—

Covert Mfg. Co.:	
Web.....	45%
Jute Rope.....	50¢45%
Sisal Rope.....	35¢45%
Cotton Rope.....	45¢42%
Hemp Rope.....	45¢42%
Covert's Saddlery Works:	
Web and Leather Halters.....	70%
Jute and Manila Rope Halters.....	70%
Sisal Rope Halters.....	60¢20%
Jute, Manila and Cotton Rope Ties.....	70%
Sisal Rope Ties.....	60¢10%

Hammers—**Handled Hammers—**

Heller's Machinists'.....	40¢10¢40¢10%
Heller's Farriers.....	40¢10¢40¢10%
Magnetic Tack, Nos. 1, 2, 3.....	\$1.25
Rock, Stow & Wilcox.....	60¢10¢5%
Fayette B. Plumb:	
Plumb, A. E. Nail.....	33%¢7%¢33%¢10¢7%
Engineers' and H. S. Hand.....	50¢7%¢50¢7%
Machinists' Hammer.....	50¢50¢10¢45%
Riveting and Tinner's.....	40¢2%¢40¢10¢2%
Sargent's C. S. New List.....	40%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....	80¢10¢10¢85%
3 to 5 lb., per lb. 40¢.....	80¢10¢10¢85%
Over 5 lb., per lb. 30¢.....	85¢85¢10%
Wilkinson's Smiths'.....	1 lb. 9¢10¢

Handles—

Agricultural Tool Handles	
Axe, Pick, &c.....	60¢5¢60¢10¢5%
Hoe, Rake, &c.....	45¢50¢5%
Fork, Shovel, Spade, &c.....	45¢50¢5%
Long Handles.....	45¢50¢5%
D Handles.....	40%

Cross-Cut Saw Handles—

Atkins'.....	40¢5%
Champion.....	40¢45¢10%
Disston's.....	50%

Mechanics' Tool Handles—

Auger, assorted.....	gro. \$2.50¢\$2.85
Brad Axl.....	gro. \$1.65¢\$1.85
Chisel Handles:	
Apple Tanged Firmer, gro. assorted.....	\$2.40¢\$2.65
Hickory Tanged Firmer, gro. assorted.....	\$2.15¢\$2.40
Apple Socket Firmer, gro. assorted.....	\$1.75¢\$1.95
Hickory Socket Firmer, gro. assorted.....	\$1.45¢\$1.60
Hickory Socket Framing, gro. assorted.....	\$1.60¢\$1.75
File, assorted.....	gro. \$1.30¢\$1.40
Hammer, Hatchet, Axe, &c.....	60¢10¢40¢10%
Hand Saw, Varnished, doz. 80¢85¢; Not Varnished.....	65¢75¢
Plane Handles:	
Jack, doz. 30¢; Jack, Bolted.....	75¢
Fore, doz. 45¢; Fore, Bolted.....	90¢
Chapin-Stephens Co.:	
Carving Tool.....	40¢40¢10%
Chisel.....	65¢65¢10%
File and Awl.....	65¢65¢10%
Saw and Plane.....	40¢40¢10%
Screw Driver.....	40¢40¢10%
Millers Falls Adj. and Hatchet Auger Handles.....	15¢10%
Nicholson Simplicity File Handle.....	3/4 gro. \$0.85¢\$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Barn Door, New Pattern, Round Groove, Regular:	
Inch.....	3 4 5 6 8
Single Doz.....	\$0.90 1.35 1.80 1.95 2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch.....	3 4 5 6
Single Doz.....	\$1.30 1.85 2.50 3.00
Albion Mfg. Co.:	
Reliable, No. 1.....	per doz. \$8.00
Reliable, No. 2.....	per doz. \$9.00
Chicago Spring Butt Co.:	
Friction.....	25%
Oscillating.....	25%
Big Twin.....	25%
Chisholm & Moore Mfg. Co.:	
Baggage Car Door.....	50%
Elevator.....	30%
Railroad.....	50%
Cronk & Carrier Mfg. Co.:	
Loose Axle.....	60¢10¢5%
Roller Bearing.....	75¢5%
Griffin Mfg. Co.:	
Solid Axle, No. 10.....	\$12.00.....70%
Roller Bearing, No. 11.....	\$15.00.....70%
Roller Bearing, Ex. Hy., No. 12.....	\$18.00.....70%
Hinged Hangers.....	\$16.00.....60¢10%
Lane Bros. Co.:	
Parlor, Ball Bearing.....	\$4.00
Parlor, Standard.....	\$3.15
Parlor, No. 109.....	\$2.85
Parlor, New Model.....	\$2.80
Parlor, New Champion.....	\$2.25
Barn Door, Standard.....	60¢10¢2%
Hinged.....	net \$4.40
Covered.....	60¢10%
Special.....	70¢5%
Lawrence Bros.:	
Advance.....	60¢10%
Cleveland.....	70¢5%
Clipper, No. 75.....	60%
Crown.....	60¢10%
Elevator, No. 109.....	60%
Parlor Door, No. 109.....	60%
Single Sets.....	\$1.25.....60¢5%
Giant.....	70¢5%
Hummer.....	70¢5%
New York.....	60¢10%
Pierces.....	70¢5%
Sterling.....	60¢10%
McKinney Mfg. Co.:	
No. 1, Special.....	\$15.....60¢10%
No. 2, Standard.....	\$18.....60¢10%
Hinged Hangers.....	\$16.....50%
Parlor, Standard Hangers.....	60%
Richards Mfg. Co.:	
Pioneer Wood Track No. 3.....	\$2.15
Ball B'g S'g'l Track No. 10.....	\$2.40
Ball B'g S'g'l Track No. 12.....	\$2.30
Ball B'g S'g'l Track No. 13.....	\$2.40
Ball B'g S'g'l Track No. 14.....	\$2.30
Hero, Adj. Track.....	No. 19.....50%
Adjustable Track Tandem Trolley Track No. 16.....	50%
Seal, Steel Track No. 8.....	\$2.40
Auto Adj. Track No. 22.....	40¢10%
Trolley B. D. No. 120.....	\$2.35
Trolley F. D. No. 121.....	\$2.45
Trolley F. D. No. 150.....	\$2.60
Safety Underwriters F. D. No. 1.....	\$2.25
Tandem No. 1.....	70¢10%
Trolley F. D. No. 151.....	\$3.00
Palace, Adjustable Track No. 132.....	40¢10%
Royal, Adjustable Track No. 133.....	40¢10%
Ives Wood Track No. 12.....	\$1.15
Trolley B. D. No. 20.....	\$1.35
Trolley B. D. No. 24.....	\$1.45
Trolley B. D. No. 27.....	\$1.50
Trolley B. D. No. 28.....	\$1.66
Roller Bearings No. 39, 40.....	40%
Anti-friction No. 42.....	60¢10%
Hinged Tandem No. 48.....	60%
Folding Door B. B. Swivel No. 135.....	30%
Sargent & Sons Hanger Co.:	
Storm King Hanger.....	60%
U. S. Standard Hinge.....	60%
Stowell Mfg. & Foundry Co.:	
Acme Parlor Ball Bearing.....	40%
Ajax Hinge Door.....	60%
Apex Parlor Door.....	50¢10%
Atlas.....	60%
Baggage Car Door.....	50%
Climax Anti-Friction.....	50¢10%
Elevator.....	40%
Express.....	50%
Freight Car Door.....	50%
Interstate.....	50¢10%
Lundy Parlor Door.....	50¢10%
Magic.....	60%
Matchless.....	60¢10%
Nansen.....	70¢5%
Parlor Door.....	1.00¢10%
Railroad.....	50¢10%
Rex Hinge Door.....	60%
Street Car Door.....	50%
Steel, Nos. 300, 401, 500.....	50¢10%
Underwriters' Fire Door.....	40%
Wild West Warehouse Door.....	40%
Zenith for Wood Track.....	50¢10%
A. L. Sweet Iron Works:	
Check Back.....	70%
Climax Anti-Friction.....	50¢10%
Apex Hinge.....	70%
Hyo Hinge.....	60%
New Perfection.....	60%
Pilot.....	60%
Pilot Hinge.....	60%
Rider Wooster.....	65%
Western Pattern.....	70%
Taylor & Boggs Fy Co.'s Kidder's Roller Bearing.....	50¢15¢10¢45%
Wilcox Mfg. Co.:	
Bike Roller Bearing.....	60¢10%
C. J. Roller Bearing.....	60¢10%
Cycle Ball Bearing.....	1.00¢10%
Dwarf Ball Bearing.....	40%
Ives Wood Track.....	60¢10%
L. T. Roller Bearing.....	60¢10¢5%
New Era Roller Bearing.....	50¢10%
O. K. Roller Bearing.....	60¢10¢5%
Prindle Wood Track.....	60%
Richards' Wood Track.....	60%
Richards' Steel Track.....	50¢10%
Spencer Roller Bearing.....	60¢10%
Tandem, Nos. 1 and 2.....	60%
Underwriters' Roller Bearing.....	40%
Wilcox Auditorium Ball B'g.....	20%
Wilcox Barn Trolley No. 125.....	40%
Wilcox Elev. Door, Nos. 112 and 122.....	50%
Wilcox Elev. Door, No. 132.....	40%
Wilcox Fire Trolley, Roller Bearing.....	40%
Wilcox Le Roy Noiseless Ball Bearing.....	40%
Wilcox New Century.....	50¢10¢10%
Wilcox O. K. Steel Track.....	50%
Wilcox O. K. Trolley.....	40%
Wilcox Trolley Ball Bearing.....	40%
Wilcox Wideman Narrow Gauge.....	40%
Ball Bearing.....	40%
For Track, see Rail.	

Hangers— Garment—

Pullman Trouser, No. 1.....	gro. \$1.00
Pullman Trouser, No. 4.....	gro. \$2.00
Victor Folding.....	gro. \$0.60
Western, W. G. Co.....	70¢10%

Gate—

Myers' Patent Gate Hangers, 3/4 doz. net.....	\$4.50
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Hasps—

McKinney's Perfect Hasp, 3/4 doz.....	50%
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Hatchets—

Regular list, first quality.....	40¢75%
Second quality.....	\$1.00 per doz. less than first quality.

Heaters, Carriage—

Wrought Iron Hinges—

Strip and T Hinges, etc., list
December 20, 1904:

Light Strap Hinges.....70%	Extra 10% @ 100%
Heavy Strap Hinges.....75%	
Light T Hinges.....65%	
Heavy T Hinges.....60%	
Extra H'y T H'g's.....70%	
Heavy Hasps.....50%	
Cor. Heavy Strap.....75%	
Cor. H'y T H'g's.....70%	
Cor. Hook.....60%	
Service Hook.....1 1/2 to 20 in. lb. 3 1/2	
and Strap.....22 to 36 in. lb. 3	

Service Hook and Eye.....lb. 6	
to 1 inch.....lb. 7	
1 1/2 inch.....lb. 9	

Hitchers, Stall—

Coast Mfg. Co., Stall Hitchers.....35%

Hods— Coal—

Inch.....15 16 17 18	
Galt. Open.....\$2.50 2.75 3.00 3.25	
Jap. Open.....\$1.90 2.10 2.25 2.55	
Galt. Funnel.....\$3.00 3.30 3.60 3.90	
Jap. Funnel.....\$2.45 2.65 2.85 3.30	

Masons, Etc.—

Cleveland Wire Spring Co.:	
Steel Mortar.....each \$1.45	
Steel Brick.....each \$1.10	

Hoes— Eye—

Scovill and Oval Pattern.....	
60 & 100 @ 60 & 10 & 10 %	
Grub, list Feb. 23, 1899.....	
70 & 100 @ 75 & 10 %	
D. & H. Scovill.....36%	

Handled—

NOTE.—Manufacturers are
selling from the list of September
1, 1904, but many jobbers are still
using list of August 1, 1899, or
selling at net prices.

Fl. Madison Cotton Hoe.....70 & 10 %	
Fl. Madison Centennial Hoe.....70 & 10 %	
Fl. Madison Mattock Hoes.....	
Regular Weight.....doz. 60%	
Junior Size.....doz. \$4.00	
Fl. Madison Sprouting Hoe.....doz. 50%	
Fl. Madison Dixie Tobacco.....75 & 10 %	

Kretzinger's Cut Easy.....70 & 10 %

Warren Hoe.....45 & 10 %	
W. & C. Ivanhoe.....75 & 10 %	
B. B. 6 in. Cultivator Hoe.....\$3.15	
B. B. 6 1/2 in. Cultivator Hoe.....\$3.35	
Acme Wedding Ring.....doz. net, \$4.35	
W. & C. L'ning Shuffie Hoe.....doz. \$4.85	

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Angular, 3/4 doz. \$24.00.....45 & 10 %	
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Door—

Empire.....50%	
Bardsley's.....45%	

File and Tool—

Nicholson File Holders and File	
Handles.....33% @ 40 %	

Fruit Jar—

Triumph Fruit Jar Holder, 3/4 gross,	
10.80; 3/4 doz. \$11.25	

Hooks—Cast Iron—

Bird Cage, Reading.....60%	
Bird Cage, Sargent's List.....40 & 10 %	
Ceiling, Sargent's List.....50 & 10 %	
Clothes Line, Reading List.....60 & 10 %	
Clothes Line, Sargent's List.....30 & 20 %	
Coat and Hat, Sargent's List.....50 & 10 %	
Clothes Line, Stowell's.....70%	
Coat and Hat, Reading.....45 & 20 %	
Coat and Hat, Stowell's.....70%	
Coat and Hat, Wrightsville.....60%	
Harness, Reading List.....66%	
Harness, Stowell's.....60%	
School House, Stowell's.....70%	

Wire—

Belt.....80 & 10 %	
Wire C. & H. Hooks.....75 & 10 @ 75 & 10 & 45 %	

Atlas, Coat and Hat:

Single Cases.....75%	
10 Case Lots.....75 & 10 %	
Columbian Hdw. Co., Gem.....60 & 10 %	
Parker Wire Goods Co., King.....75 & 10 %	
Can Wagoner, Coat and Hat.....70%	
Western W. G. Co. Molding.....75%	
Wire Goods Co.:	
Acme.....60 & 10 %	
Chief.....70%	
Crown.....65%	
V Brace.....70 & 10 %	
Car Harness.....50 & 10 %	

Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in.,	
\$1.25; 10 in., \$2.50.	
Cotton.....doz. \$1.05 @ \$1.25	
Wrought Staples, Hooks, etc.—	
See Wrought Goods.	

Miscellaneous—

Hooks, Bench, see Staps, Bench.	
Bush, Light, doz. \$1.75; Medium,	
\$5.35; Heavy, \$6.25	
Grass, best, all sizes, per doz. \$1.50	
Grass, common grades, all sizes,	
per doz. \$1.30	
Whiffletree.....lb. 5% @ 6%	

Books and Eyes:

Brass.....60 & 10 @ 60 & 10 & 10 %	
Malleable Iron.....70 & 10 @ 70 & 10 & 10 %	
Coast Mfg. Co. Gate and Scuttle	
Hooks.....35%	
Coast Saddlery Works' Self Locking	
Gate and Door Hook.....60%	
Fl. Madison Cut-Easy.....3/4 doz. \$3.25 net	

Reich Hooks—See Bench Staps.

Can Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horse.

Hose, Rubber—

Garden Hose, 3/4-inch:

Competition.....ft. 5 @ 6	
3-ply Standard.....ft. 8 @ 9	
4-ply Standard.....ft. 10 @ 11	
3-ply extra.....ft. 11 @ 13	
4-ply extra.....ft. 13 @ 16	

Cotton Garden, 3/4-in., coupled:

Low Grade.....ft. 8 @ 9	
Fair Quality.....ft. 10 @ 11	

Irons— Sad—

From 4 to 10.....lb. 8 1/4 @ 3	
B. B. Sad Irons.....lb. 3 1/4 @ 3 1/2	
Chinese Laundry.....lb. 4 1/2 @ 5	
Chinese Sad.....lb. 4 @ 4 1/4	

Mrs. Potts' cents per set:

Nos.....50 55 60 65	
Jap'd Tops.....62 69 72 69	
Tin'd Tops.....65 62 75 72	
New England Pressing.....lb. 3 1/4 @ 4	

Pinking—

Pinking Irons.....doz. 50 @ 60

Soldering—

Soldering Coppers, 2 1/2 & 3.20 @ 2 1/2	
1 1/2 & 2.....22 @ 23 1/2	

Jacks, Wagon—

Covert Mfg. Co.:	
Auto Screw.....30 & 5 %	
Steel.....45 & 2 %	
Covert's Saddlery Works.....	
Daisy.....60 & 10 %	
Victor.....60%	
Lockport.....50%	
Lane's Steel.....30 & 10 & 5 %	
Richards' Tiger Steel, No. 130.....40%	

Kettles—

Brass, Spun, Plain.....20 @ 25 %	
Enameled and Cast Iron—See Ware,	
Hollow.	

Knives—

Butcher, Kitchen, &c.—

Foster Bros' Butcher, &c.....30%	
Smith & Hemenway Co.....40 & 10 %	
Wilkinson Shear & Cutlery Co.....50%	

Corn—

Withington Acme, 3/4 doz. \$2.65;	
Dent, \$2.75; Adj. Serrated, \$2.20;	
Serrated, \$2.10; Yankee No. 1, \$1.50;	
Yankee No. 2, \$1.15.	

Drawing—

Standard List.....70 & 10 @ 75 & 10 %	
C. E. Jennings & Co., Nos. 45, 46, 60;	
Jennings & Griffin, Nos. 41, 42.....60%	
Ohio Tool Co.'s.....70%	
Swan's.....70 & 10 @ 2 1/2 %	
Watrous.....16%	
L. & I. J. White.....20 & 5 @ 25 %	

Hay and Straw—

Serrated Edge, per doz. \$5.25 @ 5.50	
Ivan's Sickle Edge.....3/4 doz. \$9.50	
Ivan's Serrated.....3/4 doz. \$10.00	

Mincing—

Buffalo.....3/4 gro. \$13.00	
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Miscellaneous—

Farriers'.....doz. \$3.00 @ 3.25	
Wostenholm's.....3/4 doz. \$3.00 @ 3.25	

Knobs—

Base, 2 1/4-inch, Birch, or Maple,	
Rubber tip.....gro. \$1.15 @ 1.20	
Carriage, Jap., all sizes.....	
gro. 40 @ 45	

Door, Mineral.....doz. 65 @ 70

Door, Por. Jap'd.....doz. 70 @ 75

Door, Por. Nickel.....doz. \$2.05 @ 2.15

Hardley's Wood Door, Shutters, &c. 15%

Picture, Sargent's.....60 & 10 %

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Lane's Store.....25%	
Myers' Noiseless Store Ladders.....50%	
Richards Mfg. Co.:	
Improved Noiseless, No. 112.....40%	
Climax Shelf, No. 113.....40%	
Trolley, No. 109.....40%	

Ladies, Melting—

L. & G. Mfg. Co. (low list).....25%	
P. S. & W.....50%	
Reading.....60%	
Sargent's.....50 & 10 %	

Lanterns— Tubular—

Regular Tubular, No. 0.....	
doz. \$1.25 @ 1.45	
Lift Tubular, No. 0.....	
doz. \$1.50 @ 1.55	
Hinge Tubular, No. 0.....	
doz. \$1.50 @ 1.55	

Other Styles.....40 & 10 @ 40 & 10 & 5 %

Bull's Eye Police—

No. 1, 2 1/4-inch.....\$2.50 @ 2.75	
No. 2, 3-inch.....\$2.75 @ 3.00	

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%	
Stowell's Badger, Cast Iron.....50%	

Latches— Thumb—

Roggin's Latches, with screw.....	
doz. 35 @ 40	

Door—

Richards' Bull Dog, Heavy No. 125.....40%	
Richards' Trump, No. 127.....50%	

Leaders, Cattle—

Small.....doz. 50 @ 55	
Covert Mfg. Co.....30%	
Lifters, Transom—	
R. & E.....33%	

Lines—

Wire Clothes, Nos. 18.....19 20	
100 feet.....\$2.20 2.00 1.65	
75 feet.....\$1.80 1.70 1.30	

Samson Cordage Works:

Solid Braided Chalk, Nos. 0 to 3.....40%	
Silver Lake Braided Chalk, No. 0,	
\$6.00; No. 1, \$6.50; No. 2, \$7.00; No.	
3, \$7.50.....\$7.00 @ 30 %	

Masons' Lines, Shade Cord, &c.:

White Cotton, No. 3 1/2.....\$1.50; No. 4,	
\$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2,	
\$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;	
Lines, No. 3 1/2, \$2.50; No. 4, \$3.50;	
No. 4 1/2, \$4.50.....20%	

Tent and Awning Lines: No. 5,

White Cotton, \$7.50; Drab Cotton,	
\$8.50.....20%	
Clothes Lines, White Cotton: 50 ft.,	
\$2.75; 60 ft. \$3.25; 70 ft. \$3.75; 75	
ft. \$4.00; 80 ft. \$4.25; 90 ft. \$4.75;	
100 ft. \$5.25.....20%	

Anniston Waterproof Clothes, 50 ft.,

3/4 gro. \$24.00; Gilt Edge, \$22.00; Air	
Line \$22.00; Acme, \$17.00; Alabama,	
\$15.00; Empire, \$14.00; Advance,	
\$13.50; Oriole, \$20.00; Albemarle,	
\$13.50; Eclipse, \$12.50; Chicago,	
\$11.00; Standard, \$10.00; Columbia,	
\$9.50; Allston, \$12.50; Calhoun, \$11.00.	

Locks— Cabinet—

Cabinet Locks.....33 1/2 @ 33 1/2 & 7 1/2 %	
Door Locks, Latches, &c.—	

NOTE.—Net Prices are very often made

on these goods.	
Reading Hardware Co.....45 & 20 %	
R. & E. Mfg. Co.....40%	
Sargent & Co.....40 & 10 %	
Stowell's Steel Door Latches.....50%	

Elevator—

Stowell's.....50%	
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Padlocks—

Wrought Iron.....75 & 10 @ 5 @ 80 & 65 %	
R. & E. Mfg. Co. Wrought Steel and	
Brass.....75 @ 75 & 10 %	

Sash, &c.—

Ives' Patent:	
Bronze and Brass.....62 1/2 %	
Crescent.....50 & 10 %	
Iron.....62 1/2 %	
Window Ventilating.....60%	
Robison Patent Ventilating Sash	
Lock.....40%	
Wrought Bronze and Brass.....55%	
Wrought Steel.....55%	
Pullman Patent Ventilating Lock.....25%	
Reading.....60%	

Machines—Boring—

Com. Up'r't, without Augers.....\$2.00	
Com. Ang'l'r, without Augers.....\$2.25	

Without Augers.	
R. & E. Mfg. Co.:	
Improved No. 3, \$4.25 No. 1, \$5.00.	
Improved No. 4, 3.75 No. 2, 3.38	
Improved No. 5, 2.75	
Jennings' Nos. 1 and 4.....35 & 5 %	
Millers' Falls.....5.75	
Snell's, Rice's Pat. 2.50.....2.75	

Corking—

Reisinger Invincible Hand Power.....	
3/4 doz. \$18.00	

Fence—

Williams' Fence Machines.....each, \$5.50	
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Hoisting—

Sisal, Tarred, Medium Lath
Yarn:
 Mixed lb. 7 3/4 c
 Pure lb. 9 1/4 c
Colton Rope:
 Best, 1/4-in. and larger 16c
 Medium, 1/4-in. and larger 14c
 Common, 1/4-in. and larger 10 1/2 c
Julie Rope:
 Thread No. 1, 1/4-in. & up, lb. 6 1/4 c
 Thread No. 2, 1/4-in. & up, lb. 7 3/4 c
 Old Colony Manila Transmission
 Rope lb. 17 1/2 c

Wire Rope—

Galvanized 2 1/2 c @ 2 1/4 c
 Plain 50 c @ 2 1/4 c

Ropes, Hammocks—

Cover Mfg. Co.:
 Jute 50 c @ 5 c
 Sisal 35 c @ 5 c
 Cover Saddlery Works 60 c @ 5 c

Rules—

Barnwood 60 c @ 10 c @ 10 c
 Ivory 35 c @ 10 c @ 35 c @ 10 c
 Chapin-Stephens Co.:
 Roxwood 60 c @ 60 c @ 10 c
 Miscellaneous 50 c @ 50 c @ 10 c
 Combination 55 c @ 55 c @ 10 c
 Stationers 10 c @ 10 c @ 10 c

Kentell & Emsw Co.:
 Folding, Wood 35 c @ 10 c
 Folding, Steel 33 1/2 c @ 10 c
 Lufkin's Steel 50 c @ 10 c
 Lufkin's Lumber 60 c @ 10 c
 Stanley R. & L. Co.:
 Roxwood 62 1/2 c @ 10 c
 Ivory 45 c @ 10 c
 Miscellaneous 60 c @ 10 c
 Zig Zag 40 c @ 10 c
 Zig Zag, Pin Joint 42 1/2 c @ 10 c
 Union Nut Co.:
 Roxwood 60 c @ 10 c @ 10 c
 Ivory 35 c @ 10 c @ 35 c @ 10 c

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Saws—**

Atkins:
 Circular 50 c @ 10 c
 Hand 50 c @ 10 c @ 60 c
 Cross Cuts 35 c @ 5 c
 Mulay, Mill and Drag 50 c @ 5 c
 One-Man Saw 40 c @ 5 c
 Wood Saws 40 c @ 5 c
 Hand, Compound & 40 c @ 5 c
 Chapin-Stephens Co.:
 Turning Saws and Frames 30 c @ 30 c @ 10 c
 Diamond Saw & Stamping Works:
 Sterling Kitchen Saws 30 c @ 10 c @ 5 c
 Disston's:
 Circular, Solid and Inset Tooth 50 c @ 10 c
 Hand, 2 to 14 in. wide 50 c @ 10 c
 Hand, 1/4 to 1 1/2 60 c @ 10 c
 Crosscuts 50 c @ 10 c
 Mulay, Mill and Drag 50 c @ 10 c
 Framed Woodsaws 35 c @ 10 c
 Woodsaw Blades 25 c @ 10 c
 Woodsaw Rods 25 c @ 10 c
 Hand Saws, Nos. 12, 90, 9, 16, d100, 0, 00, Combination 25 c @ 10 c
 Compass, Key Hole, &c. 25 c @ 10 c
 Butcher Saws and Blades 35 c @ 10 c
 C. E. Jennings & Co.'s:
 Rack Saws 25 c @ 10 c
 Butcher Saws 30 c @ 10 c
 Compass and Key Hole Saws 35 c @ 10 c
 Framed Wood Saws 20 c @ 10 c
 Hand Saws 20 c @ 10 c
 Wood Saw Blades 35 c @ 10 c
 Millers Falls:
 Butcher Saws 15 c @ 10 c
 Star Saw Blades 15 c @ 10 c
 Peace & Richardson's Hand Saws 30 c @ 10 c
 Simonds:
 Circular Saws 50 c @ 10 c
 Crescent Ground Cross Cut Saws 35 c @ 10 c
 One-Man Cross Cuts 40 c @ 10 c
 Gang Mill, Mulay and Drag Saws 50 c @ 10 c
 Hand Saws 25 c @ 10 c
 Rack Saws 25 c @ 10 c
 Butcher Saws 35 c @ 10 c
 Hand Saws 25 c @ 10 c
 Hand Saws, Bay State Brand 45 c @ 10 c
 Compass, Key Hole, &c. 25 c @ 10 c
 Wood Saws 35 c @ 10 c
 Springfield Mach. Screw Co.:
 Diamond Kitchen Saws 40 c @ 10 c @ 50 c
 Butcher Saws 35 c @ 10 c
 Wheeler, Madden & Clemons Mfg. Co.'s Cross Cut Saws 50 c @ 10 c

Hack Saws—

Atkins' Hack Saw Blades A A A 25 c @ 10 c
 Disston's:
 Concave Blades 25 c @ 10 c
 Keystone 25 c @ 10 c
 Hack Saw Frames 25 c @ 10 c
 Fitchburg File Works, The Best 25 c @ 10 c
 C. E. Jennings & Co.'s:
 Hack Saw Frames, Nos. 175, 180 10 c @ 7 1/2 c
 Hack Saws, Nos. 175, 180, complete 40 c @ 7 1/2 c
 Goodell's Hack Saw Blades 40 c @ 10 c
 Griffin's Hack Saw Frames 35 c @ 10 c
 Griffin's Hack Saw Blades 35 c @ 10 c
 Springfield Mach. Screw Co.:
 Diamond Hack Saw Blades 35 c @ 10 c
 Diamond Hack Saw Frames 35 c @ 10 c
 Star Hack Saws and Blades 15 c @ 10 c
 Sterling Hack Saw Blades 35 c @ 10 c
 Sterling Hack Saw Frames 30 c @ 10 c @ 5 c

Scroll—

Burns' No. 7, 115 25 c @ 10 c
 Burns' Scroll Saw Blades 40 c @ 10 c
 Burns' Velocipede Power Scroll Saw, without boring attachment, \$18, with boring attachment, \$20 15 c @ 10 c
 Lester, complete, \$10.00 15 c @ 10 c
 Rogers, complete, \$4.00 15 c @ 10 c

Scalers, Fish—

Covett's Saddlery Works 60 c @ 10 c

Scales—

Family, Turnbull's 50 c @ 50 c @ 10 c

Counter:

Hatch, Platform, 1/4 oz. to 4 lbs. 50 c @ 10 c

Two Platforms, 1/4 oz. to 8 lbs. 16 c @ 10 c

Union Platform, Plain \$1.70 @ 1.90

Union Platform, Stpd. \$1.85 @ 2.15

Chatillon's:
 Favorite 25 c @ 10 c
 Crocers Trip Scales 50 c @ 10 c

Chicago Scale Co.:
 The "Little Detective" 25 lbs 50 c @ 10 c
 Union or Family No. 2 60 c @ 10 c
 Portable Platform (reduced list) 25 c @ 35 c
 Wagon or Stock (reduced list) 25 c @ 35 c
 "The Standard" Portables 50 c @ 10 c
 "The Standard" R. R. and Wagon 50 c @ 10 c

Scrapers—

Box, 1 Handle doz. \$2.00 @ 2.25

Box, 2 Handle doz. \$2.60 @ 2.85

Ship Light, \$2.00; Heavy, \$4.50

Adjustable Box Scraper (S. R. & L. Co.), \$6.00 45 c @ 10 c

Chapin-Stephens Co., Box 50 c @ 50 c @ 10 c

Screens, Window and Frames—

Air Line Pattern Screens 60 c @ 10 c

Plyer Pattern Screens 60 c @ 10 c @ 10 c

Maine Screen Frames 40 c @ 10 c

Perfection Screens 50 c @ 10 c @ 10 c

Phillips' Screen Frames 60 c @ 10 c @ 10 c

See also Doors.**Screws—Bench and Hand**

Bench, Iron, doz., 1 in., \$2.50 @ 2.75

2 1/2; 1 1/2, \$3.00 @ 3.25; 1 1/4, \$3.50 @ 3.75

Bench, W'd. Beech, doz. 30 c @ 30 c @ 5 c

Hand, Wood 30 c @ 30 c @ 5 c

R. Bliss Mfg. Co., Hand 30 c @ 30 c @ 10 c

Chapin-Stephens Co., Hand 30 c @ 30 c @ 10 c

Ohio Tool Co., Bench and Hand 30 c @ 10 c

Coach, Lag and Hand Rail 10 c @ 10 c

Lag, Cone Point, list Oct. 1, '99 75 c @ 20 c

Coach, Gt. Point, list Oct. 1, '99 75 c @ 15 c

Hand Rail, list Jan. 1, '81 70 c @ 10 c @ 75 c

Jack Screws—

Standard List 75 c @ 10 c @ 80 c @ 5 c

Millers Falls 50 c @ 10 c @ 10 c

Millers Falls, Roller 50 c @ 10 c

P. S. & W. 50 c @ 50 c @ 5 c

Sargent 70 c @ 10 c

Swett Iron Works 75 c @ 10 c @ 80 c @ 5 c

Machine—

List Jan. 1, '98:

Flat or Round Head, Iron 50 c @ 50 c @ 10 c

Flat or Round Head, Brass 50 c @ 50 c @ 10 c

Set and Cap—

Set (Iron or Steel) 80 c @ 80 c @ 10 c @ 10 c

Sq. Hd. Cap 75 c @ 75 c @ 10 c

Hex. Hd. Cap 75 c @ 75 c @ 10 c

Rd. or Filler Hd. Cap 65 c @ 65 c @ 10 c

Wood—

List July 23, 1903.

Manufacturers' printed discounts:

Flat Head, Iron 87 1/2 c @ 100 c @ 10 c

Round Head, Iron 85 c @ 100 c @ 10 c

Flat Head, Brass 85 c @ 100 c @ 10 c

Round Head, Brass 80 c @ 100 c @ 10 c

Flat Head, Bronze 77 1/2 c @ 100 c @ 10 c

Round Head, Bronze 75 c @ 100 c @ 10 c

Drive Screws 87 1/2 c @ 10 c

Scroll Saws—

See Saws, Scroll.

Scythes—

Prices announced for next season:

Clipper Pattern, Grass \$6.20

Full Polished, Clipper \$6.75

Grain \$8.00

Clipper, Grain \$8.25

Weed and Bush \$6.25

Seeders, Raisin—

Enterprise 25 c @ 30 c

Sets—Awl and Tool—

Bradawl and Tool Sets:

Wood Handle, 10 Acls, doz. \$2.00

Wood Handle, 14 Acls, doz. \$2.40

Tools 25 c @ 10 c

Aiken's Sets, Awl and Tools:
 No. 20, doz. \$10.00 50 c @ 10 c

Fray's Adj. Tool Handles, No. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$7 50 c @ 10 c

C. E. Jennings & Co.'s Model Tool Holders 30 c @ 10 c

Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18 15 c @ 10 c

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel doz sets \$9.00

Nail—

Square per gro. \$2.25 @ 2.50

Round, Blk. and Pol., assorted gro. \$1.80 @ 2.00

Octagon gro. \$3.50 @ 3.75

Buck Bros 27 1/2 c @ 10 c

Cannon's Diamond Point, doz. \$12.25

Mayhew's doz. \$9.00

Snell's Cannon's Diamond Point doz. \$7.20

Snell's Corrugated, Cup Pt. doz. \$7.20

Snell's Knurled, Cup Pt. doz. \$7.20

Springfield Mach. Screw Co.:
 Diamond Knurled Cup Pt. doz. \$7.50

Rivet—

Regular list 75 c @ 75 c @ 10 c

Saw—

Aiken's:
 Genuine 50 c @ 10 c

Imitation 50 c @ 10 c

Atkins:
 Criterion 40 c @ 10 c

Adjustable 40 c @ 10 c

Bemis & Call Co.'s:

Cross Cut 30 c @ 10 c

Plate 20 c @ 10 c

Disston's Star and Monarch 25 c @ 10 c

Morrill's No. 1, \$15.00 50 c @ 10 c

Nos. 3 and 4, Cross Cut, \$20.65 50 c @ 10 c

No. 5, Mill, \$30.00 50 c @ 10 c

Nos. 10, 11, 95, \$15.63 50 c @ 10 c

No. 1 Old Style, \$10.00 50 c @ 10 c

Special, \$16.25 50 c @ 10 c

Great Royal, Cross Cut doz. \$8.50

Royal, Cross Cut doz. \$5.00

Taintor Positive doz. \$6.75

Shaving—

Fox Shaving Sets, No. 30 doz., net, \$24.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. 65 c @ 10 c

Shaves, Spoke—

Iron doz. \$1.10 @ 1.25

Wood doz. \$1.75 @ 1.25

Bailey's (Stanley R. & L. Co.) 45 c @ 10 c

Razor Edge (Stanley R. & L. Co.) 35 c @ 10 c

Chapin-Stephens Co. 30 c @ 30 c @ 10 c

Goodell's doz. \$9.00 15 c @ 10 c

Wood's Fl and F2 50 c @ 10 c

Shears—

Cast Iron, 7 9 in.

Best \$16.00 18.00 20.00 gro.

Good \$13.00 15.00 17.00 gro.

Cheap \$5.00 6.00 7.00 gro.

Straight Trimmers, &c.:

Best quality, Jap. 70 c @ 10 c

Best quality, Nickel 60 c @ 10 c

Fair quality, Jap. 80 c @ 10 c

Fair quality, Nickel 75 c @ 10 c

Tailors' Shears 40 c @ 10 c

Acme Cast Shears 40 c @ 10 c

Heinisch's Tailors' Shears 40 c @ 10 c

Wilkinson's Hedge, 1900 list 45 c @ 10 c

Wilkinson's Branch, Lawn & Border, 40 45 c @ 10 c

Wilkinson's Sheep, 1900 list 50 c @ 10 c

Tinners' Snips—

Steel Blades 20 c @ 50 c @ 10 c

Steel Laid Blades 40 c @ 10 c @ 50 c

Forged Handles, Steel Blades, Berlin 40 c @ 10 c

Heinisch's Snips 40 c @ 10 c

Jennings & Griffin Mfg. Co.'s, 6 1/2 to 10 in. Snips 40 c @ 10 c

Niagara Snips 40 c @ 10 c

P. S. & W. Co. 20 c @ 10 c

Pruning Shears and Tools

Cronk's Grape Shears 33 1/2 c @ 10 c

Cronk's Pruning Shears 33 1/2 c @ 10 c

Disston's Combined Pruning Hook and Saw, doz. \$18.00 25 c @ 10 c

Disston's Pruning Hook, doz. \$12.00 25 c @ 10 c

John T. Henry Mfg. Co.:
 Pruning Shears, all grades 40 c @ 10 c

Orange Shears 50 c @ 10 c @ 20 c

Grape 40 c @ 10 c @ 50 c

Tree Pruners 75 c @ 10 c

P. S. & W. Co. 33 1/2 c @ 10 c

Sheaves—Sliding Door—

Stowell's Anti-Friction 50 c @ 10 c

Patent Roller, Hatfield's, Sargent's 70 c @ 10 c

Reading 60 c @ 10 c

R. & E. list 33 1/2 c @ 10 c

Wrightsville Hatfield Pattern 80 c @ 10 c

Sliding Shutter—

Reading list 45 c @ 20 c

Pike Mfg. Co., 1901 list:
 Black Diamond S. S., 1/2 gro. \$12.00
 Lamolite S. S., 1/2 gro. \$11.00
 White Mountain S. S., 1/2 gro. \$9.00
 Green Mountain S. S., 1/2 gro. \$6.00
 Extra Indian Pond S. S., 1/2 gro. \$7.50
 No. 1 Indian Pond S. S., 1/2 gro. \$7.00
 No. 2 Indian Pond S. S., 1/2 gro. \$4.50
 Leader Red End S. S., 1/2 gro. \$4.50
 Emery and Corundum, 10 in., 1/2 gro. \$3.00
 Pure Corundum, 10 in., 1/2 gro. \$3.00
 Crescent
 Emery Scythe Rifles, 2 Coat, \$8
 Emery Scythe Rifles, 3 Coat, \$10
 Emery Scythe Rifles, 4 Coat, \$12
 Balance of 1904 list 33 1/2 %

Oil Stones, &c.—
 Chicago Wheel & Mfg. Co., 1901 list:
 Gem Corundum Oil, Double Grit, 50 %
 Gem Corundum Oil, Single or Double Grit, 50 %
 Gem Corundum Slips, 50 %
 Gem Corundum Razor Hones, 50 %
Pike Mfg. Co., 1901 list:
 Arkansas St. No. 1, 3 to 5 in. \$2.80
 Arkansas St. No. 1, 5 1/2 to 8 in. \$3.50
 Arkansas Slips No. 1, 4 to 8 in. 60 %
 Lily White Washita, 4 to 8 in. 60 %
 Rosy Red Washita, 4 to 8 in. 60 %
 Washita St., No. 1, 4 to 8 in. 50 %
 Washita St., No. 2, 4 to 8 in. 40 %
 Washita St., No. 3, 4 to 8 in. 30 %
 Lily White Slips, 4 to 8 in. 60 %
 Rosy Red Slips, 4 to 8 in. 60 %
 Washita Slips, Extra, 4 to 8 in. 60 %
 Washita Slips, No. 1, 4 to 8 in. 70 %
 Washita Slips, No. 2, 4 to 8 in. 40 %
 India Oil Stones (entire list) 50 %
 Quickcut Emery and Corundum Oil Stone, Double Grit, 33 1/2 %
 Quickcut Emery and Corundum Oil Stone, Double Grit, 33 1/2 %
 Quickcut Emery Rubbing Bricks, 33 1/2 %
 Hindostan No. 1, R. G. R., 1/2 doz. \$1.00
 Hindostan No. 1, Small, 1/2 doz. \$1.00
 Axe Stones (all kinds) 50 %
 Turkey Oil Stones, Extra, 5 to 8 in. 80 %
 Queer Creek Stones, 4 to 8 in. 20 %
 Queer Creek Slips, 4 to 8 in. 20 %
 Sand Stone, 6 in. 60 %
 Belgian, German and Swaty Razor Hones 50 %
 Natural Grit Carving Knife Hones 50 %
 Quick Edge Pocket Knife Hones 40 %
 Mounted Kitchen Sand Stone, 1/2 doz. \$1.50

Stoners, Cherry—
 Enterprise 25 @ 30 %

Stoppers, Bottle—
 Victor Bottle Stoppers, 1/2 gro. \$9.00

Stops—Bench—
 Millers Falls, 1/2 doz. No. 1, \$10.00, 50 %
 Morrill's, 1/2 doz. No. 1, \$10.00, 50 %
 Mori II's, No. 2, \$12.50, 50 %

Door—
 Chapin-Stephens Co., 60 @ 60 & 10 %

Plane—
 Chapin-Stephens Co., 20 %

Straps—Box—
 Cary's Universal, case lots, 20 @ 10 & 10 %

Hame—
 Covert's Saddlery Works, 60 @ 10 %

Stretchers, Carpet—
 Cast Iron, S. I. Points, doz. 55 @ 60 %

Socket—
 Excelsior Stretcher and Tack Hammer Combined, 1/2 doz. \$6.00, 20 %

Stuffers, Sausage—
 Enterprise Mfg. Co., 20 @ 25 & 7 1/2 %
 National Specialty Co., list Jan. 1, 1902, 30 @ 65 %

Sweepers, Carpet—
 National Sweeper Co., 1/2 doz. Auditorium Roller Bearing (30 in. case), Nickel, \$54.00
 Mammoth Roller Bearing (30 in. case), Nickel, \$50.00
 Marion Roller Bearing, Regular finishes, full Nickel, \$24.00
 Marion Queen Roller Bearing, full Nickel, \$24.00
 Monarch Roller Bearing, N'kel, \$22.00
 Monarch Roller B'rg, Jap'ned, \$22.00
 Transparent Roller Bearing, Plate Glass Top, Nickel, \$36.00
 Monarch Extra Roller Bearing, (17-in. case), Nickel, \$36.00
 Monarch Extra Roller Bearing, (17-in. case), Jap'ned, \$36.00
 National Queen, Fancy Veneer, \$27.00
 Perpetual, Regular B'rgs, N'kl, \$20.00
 Perpetual, Regular B'rgs, Jap, \$18.00
 Triple Medal, \$24.00

NOTE—Rebates: 50c per dozen on three-dozen lots; \$1 per dozen on five-dozen lots; \$1 per dozen on ten-dozen lots; \$2.50 per dozen on twenty-five-dozen lots

Tacks, Brads, &c.—
 List Jan. 15, '99.

Carpet Tacks—
 American Cut Tacks, 90 @ 20 @ 50 %
 Succes Cut Tacks, 90 @ 35 @ 50 %
 Succes Upholsterers' Tacks, 90 @ 10 @ 50 %

Gimp Tacks—
 90 @ 15 @ 50 %
Lace Tacks—
 90 @ 15 @ 50 %
Trimmers' Tacks—
 90 @ 35 @ 50 %
Looking Glass Tacks—
 65 @ 50 %
Bill Posters' and Railroad Tacks—
 90 @ 15 @ 50 %
Hungarian Nails—
 80 @ 20 @ 50 %
Common and Patent Brads—
 80 @ 10 @ 50 %

Trunk and Clout Nails—
 80 @ 10 @ 50 %

NOTE— The above prices are for Straight Weights. An extra 5 % is given on Star Weights and an extra 10 % on Standard Weights.

Miscellaneous—
 Double Pointed Tacks, 90 @ 6 or 7 tens

Steel Wire Brads, R. & E. Mfg. Co.'s list
 See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co., 30-gal. \$3.40
 Emerald, S. S. & Co., 60-gal. \$4.25
 Queen City, S. S. & Co., 30-gal. \$3.65
 Queen City, S. S. & Co., 60-gal. \$4.50

Tapes, Measuring—

American Asses' Skin, 40 @ 10 @ 50 %
 Patent Leather, 25 @ 30 @ 50 %
 Steel, 25 @ 30 @ 50 %
 Chesterman's, 25 @ 30 @ 50 %
 Eddy Asses' Skin, 40 @ 10 @ 50 %
 Eddy Patent Leather, 25 @ 30 @ 50 %
 Eddy Steel, 40 @ 10 @ 50 %
 Keuffel & Esser Co.,
 Favorite, Ass Skin, 40 @ 10 @ 50 %
 Favorite, Duck and Leather, 25 @ 30 @ 50 %

Metallic and Steel, lower list, 35 @ 35 @ 50 %

Pocket, 35 @ 35 @ 50 %

Lufkin's, 40 @ 10 @ 50 %

Asses' Skin, 40 @ 10 @ 50 %

Metallic, 35 @ 35 @ 50 %

Patent Bend, Leather, 25 @ 30 @ 50 %

Pocket, 40 @ 10 @ 50 %

Steel, 33 @ 35 @ 50 %

Teeth, Harrow—
 Steel Harrow Teeth, plain or headed, 5/8-inch and larger, per 100 lbs. \$3.00

Thermometers—
 Tin Case, 80 @ 10 @ 80 @ 10 @ 45 %

Ties, Bale—Steel Wire—
 Single Loop, 80 @ 2 1/2 %

Monitor, Cross Head, &c.—
 70 %

Brick Ties—
 Niagara Brick Ties, 25 @ 10 %

Tinners' Shears, &c.—
 See Shears, Tinners', &c.

Tinware—
 Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—
 Covert's Saddlery Works, 60 @ 10 %

Tire Benders, Upsetters, &c.
 See Benders and Upsetters, Tire.

Tools—Coopers'—
 L. & I. J. White, 20 @ 20 @ 5 %

Hay—
 Myers' Hay Tools, 50 %
 Stowell's Hay Carriers, 50 %
 Stowell's Hay Forks, 50 %
 Stowell's Fork Pulleys, 50 %

Saw—
 Atkins' Cross Cut Saw Tools, 40 %
 Simonds' Improved, 35 %
 Simonds' Crescent, 25 %

Ship—
 L. & I. J. White, 25 %

Transom Lifters—
 See Lifters, Transom.

Traps—Fly—
 Balloon, Globe or Acme, doz. \$1.50 @ \$1.25; gro. \$11.50 @ \$12.00

Harper, Champion or Paragon, doz. \$1.25 @ 1.40; gro. \$13.00 @ 13.50

Game—
 Oneida Pattern, 75 @ 10 @ 75 @ 10 @ 5 %

Newhouse, 45 @ 45 @ 5 %

Victor and Oneida, 70 @ 10 @ 70 @ 10 @ 5 %

O. C. Jump (Blake Pat.), 60 @ 5 @ 60 @ 10 %

Mouse and Rat—
 Mouse, Wood, Choker, doz. holes 8 1/2 @ 9

Mouse, Round or Square Wire, doz. 85 @ 90 %

Marty French Rat and Mouse Traps (Genuine):
 No. 1, Rat, each \$1.21; doz. \$13.25
 No. 3, Rat, 1/2 doz. \$8.50; case of 50 \$7.75
 No. 3 1/2, Rat, 1/2 doz. \$5.25; case of 72 \$4.70
 No. 4, Mouse, 1/2 doz. \$3.85; case of 150 \$3.00
 No. 5, Mouse, 1/2 doz. \$3.00; case of 150 \$2.25

Trimmers, Spoke—
 Wood's E. I., 50 %

Trowels—
 Disston Brick and Pointing, 30 %
 Disston Plastering, 25 %
 Disston "Standard Brand" and Garden Trowels, 35 %
 Kohler's Steel Garden Trowels, 5 in. 1/2 doz. \$4.80
 Kohler's Steel Garden Trowels, 6 in. 1/2 doz. \$6.00
 Never-Break Steel Garden Trowels, 1/2 doz. \$6.00

Rose Brick and Plastering, 25 @ 25 %

Woodrough & McParlin, Plastering, 25 %

Trucks, Warehouse, &c.—
 B. & L. Block Co.,
 New York Pattern, 50 @ 10 %
 Western Pattern, 60 @ 10 %
 Handy Trucks, 1/2 doz. \$16.00
 Grocery, 1/2 doz. \$15.00
 Daisy Stove Trucks, Improved Pattern, 1/2 doz. \$18.50
 McKinney Trucks, each \$10.00
 Model Stove Trucks, 1/2 doz. \$18.50

Tubs, Wash—No. 1 2 3
 Galvanized, per doz. \$4.75 5.25 6.00
 Galvanized Wash Tubs (S. S. & Co.), No. 1 2 3 10 20 30 7.20 8.10

Twine, Miscellaneous—
 Flax Twine: BC. B.
 No. 9, 1/4 and 1/2-lb. Balls, 22 @ 2 1/2 %
 No. 12, 1/4 and 1/2-lb. Balls, 18 @ 20 %
 No. 18, 1/4 and 1/2-lb. Balls, 16 @ 18 %
 No. 24, 1/4 and 1/2-lb. Balls, 16 @ 18 %
 No. 36, 1/4 and 1/2-lb. Balls, 15 @ 17 1/2 %
 Chalk Line, Cotton 1/2-lb. Balls, 30 @

Cotton Mops, 6, 9, 12 and 15 lb. to doz. 9 1/2 @ 11 1/2

Cotton Wrapping, 5 Balls @ 1 lb., according to quality, 13 1/2 @ 20

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls, 13 @ 1 1/2

American 3-Ply Hemp, 1-lb. Balls, 15 @ 1 1/2

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine), 3 1/2 @

India 3-Ply Hemp, 1-lb. Balls, 7 @ 8 1/2

India 3-Ply Hemp, 1/2-lb. Balls, 7 @ 8 1/2

2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls, 9 @ 10 1/2

Mason Line, Linen, 1/2-lb. Balls, 4 @ 4

No. 26 1/2 Mattress, 1/4 and 1/2-lb. Balls, 37 @

Wool, 3 to 6 ply, B 4 1/2 @; A 6 @

Vises—
 Solid Box, 60 @ 10 @ 60 @ 10 @ 10 %

Parallel—
 Athol Machine Co.,
 Simpson's Adjustable, 40 %
 Standard, 40 %
 Amuser, 40 %
 Columbian Hdw. Co., 40 %
 Emmert Universal,
 Pattern Makers' No. 1, \$15.00; No. 2, \$12.50; No. 3, \$10.00,
 \$12.50; No. 5, \$7.00; No. 6, \$10.00;
 No. 10, \$21.50.
 Jewelers' No. 7, \$4.00
 Fisher & Norris Double Screw, 15 @ 10 %
 Hollands', 40 @ 40 @ 5 %
 Keystone, 65 @ 70 %
 Lewis Tool Co., 20 @ 30 %
 Merrill's, 20 %
 Millers Falls, 60 @ 10 %
 Massey Vise Co.,
 Clincher, 40 %
 Perfect, 20 %
 Lightning Grip, 20 %
 Parker's,
 Victor, 20 @ 25 %
 Vulcan's, 40 @ 45 %
 Combination Pipe, 55 @ 60 %
 Prentiss, 20 @ 25 %
 Sargent's, 40 %
 Smith & Hemenway Co., 40 %
 Machinists', 33 1/2 %
 Jewelers', 33 1/2 %
 Sneliker's X. L., 33 1/2 %
 Stephens', 33 1/2 %

Saw Filers—
 Disston's D 3 Clamp and Guide, 30 %
 doz. \$50.00
 Perfection Saw Clamps, 1/2 doz. \$5.00
 Reading, 60 %
 Wentworth's Rubber Jaw, Nos. 1, 2 and 3, 45 @ 50 %

Wood Workers—
 Massey Vise Co.,
 Lightning Grip, 15 %
 Perfect, 15 %
 Wymore & Gordon's Quick Action, 16 in., \$6.00; 9 in., \$7.00; 14 in., \$6.00.

Miscellaneous—
 Bignall & Keeler Combination Pipe, 60 @ 10 %
 Holland's Combination Pipe, 60 @ 10 %
 Massey's Quick Action Pipe, 40 %
 Potts' Combination Pipe, 60 %
 187 Series, 60 @ 5 %
 187 Series, 60 @ 5 %
 No. 870, 40 @ 2 %

Wads—Price per M.

B. E., 11 up, 60 @

B. E., 9 and 10, 70 @

B. E., 8, 80 @

B. E., 7, 80 @

P. E., 11 up, \$1.00

P. E., 9 and 10, 1.25

P. E., 8, 1.50

P. E., 7, 1.50

Ely's B. E., 11 and larger, \$1.70 @ 1.75

Ely's P. E., 12 to 20, \$3.00 @ 3.25

Ware, Hollow—
 Cast Iron, Hollow—
 Stove Hollow Ware:
 Enameled, 50 @ 55 @ 10 %
 Ground, 55 @ 60 @ 10 %
 Plain or Unground, 60 @ 65 @ 10 %
 Country Hollow Ware, per 100 lbs., \$2.75 @ 3.00

White Enameled Ware:
 Maslin Kettles, 70 %

Covered Wares
 Tinned and Turned, 40 %

Enameled—
 See also Pots, Gluc.

Agate Nickel Steel Ware, 50 @ 20 %

Agate Nickel Steel Ware, Specials, 60 @ 15 %

Iron Clad Ware, 70 @ 10 %

Lava, Enameled, 40 @ 10 %

Never Break Enameled, 50 %

Tea Kettles—
 Galvanized Tea Kettles:
 Inch, 8 7 8 9
 Each, 45 @ 50 @ 55 @ 65 @

Steel Hollow Ware—
 Avery Spiders and Griddles, 60 @ 65 @ 5 %
 Avery Kettles, 60 @ 65 @ 5 %
 Porcelain, 50 @ 55 @ 10 %
 Never Break Spiders and Griddles, 60 @ 5 %

Never Break Kettles, 60 @ 5 %

Solid Steel Spiders and Griddles, 60 @ 5 %

Solid Steel Kettles, 60 @ 5 %

Warmers, Foot—
 Pike Mfg. Co., Soapstone, 40 @ 40 @ 10 %

Washboards—
 Solid Zinc:
 Crescent, family size, bent frame, \$3.25
 Red Star, family size, stationary protector, \$3.25
 Double Zinc Surface:
 Saginaw Globe, family size, stationary protector, \$2.90
 Cable Cross, family size, stationary protector, \$3.15
 Single Zinc Surface:
 Nalad, family size, open back, perforated, \$2.65
 Saginaw Globe, protector, family size, ventilated back, \$2.50
 Brass Surface:
 Brass King, Single Surface, open back, \$3.25

Nickel Plate Surface:
 No. 1001 Nickel Plate, Single Surface, \$3.25

Glass Surface:
 Glass King, Single Surface, open back, \$3.25

Enamel Surface:
 Enamel King, Single Surface, ventilated back, \$3.25

Washers—Leather, Axle—
 Solid, 80 @ 10 @ 80 @ 10 @ 10 %

Patent, 90 @ 30 @ 45 %

Coil: 1/4 1 1/4 1 1/2 1 3/4 per doz

Iron or Steel—
 Size bolt, 5-16 3/4 1/2 3/4 1 1/2 2 1/2
 Washers, \$4.95 4.05 2.75 2.55 2.25
 In lots less than one key add 1/2c per lb.; 5-lb. boxes add 1/2c to list.

Cast Washers—
 Over 1/2 inch, barrel lots, per lb. 1/2 @ 1/2

Wedges—
 Oil Finish, 1-lb. 2.15 @ (2.30)

Weights—Hitching—
 Covert Mfg. Co., 40 @ 2 %
 Covert's Saddlery Works, 60 @ 10 %

Sash—
 Per ton, f.o.b. factory:

Eastern District, \$25.00

Southern Territory, \$19.00 @ 20.00

Western and Central Districts, \$20.00 @ 21.00

Wheels, Well—
 8-in., \$1.50 @ 1.55; 10-in., \$1.65 @ 1.70; 12-in., \$2.25 @ 2.35; 14-in., \$3.10 @ 3.50.

Wire and Wire Goods—
 Bright and Annealed:

6 to 9, 80 @ 5 @ 80 @ 7 1/2 %

10 to 18, 80 @ 10 @ 80 @ 5 %

19 to 26, 80 @ 10 @ 80 @ 10 @ 5 %

27 to 36, 80 @ 5 @ 80 @ 10 %

Galvanized:
 6 to 9, 77 1/2 @ 77 1/2 @ 45 %

10 to 14, 72 1/2 @ 72 1/2 @ 45 %

15 to 16, 75 @ 75 @ 75 @ 10 @ 2 1/2 %

19 to 26, 75 @ 75 @ 75 @ 10 @ 2 1/2 %

27 to 36, 72 1/2 @ 72 1/2 @ 45 %

Coppered:
 6 to 9, 77 1/2 @ 77 1/2 @ 45 %

10 to 14, 77 1/2 @ 77 1/2 @ 45 %

15 to 18, 75 @ 75 @ 75 @ 10 @ 2 1/2 %

19 to 26, 75 @ 75 @ 75 @ 10 @ 2 1/2 %